MUNIPAY USER'S MANUAL

Multimedia Enforcement Division (2248-A)
Office of Regulatory Enforcement
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

September 2000

THIS MANUAL IS RELEASABLE IN ITS ENTIRETY

ACKNOWLEDGMENTS

This document was prepared under the technical direction of Jonathan Libber, BEN/ABEL Coordinator, Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency (EPA), with additional input provided by Leo J. Mullin, while on detail to the Policy and Program Evaluation Division, Office of Site Remediation Enforcement, U.S. EPA. Technical assistance was provided to EPA under contract by Industrial Economics, Incorporated (IEc) of Cambridge, Massachusetts.

MAILING LIST ADDITION

If you would like to receive updated materials, and you work for a federal, state or local government environmental agency, please e-mail your name, government mailing address, and government phone number to benabel@indecon.com. If you have any questions about updates, contact the EPA enforcement economics toll-free helpline at 888-ECON-SPT (326-6778).

If you are a member of the public and would like to obtain these materials, download them from the U.S. EPA's web site at http://es.epa.gov/oeca. (This address may have changed by the time you read this manual. To obtain the current address, you can call the helpline at 888-ECONSPT.)

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A. OVERVIEW

In environmental enforcement cases, the defendant/respondent may claim an inability to afford compliance costs, a Superfund cleanup contribution, and/or a penalty that the U.S. Environmental Protection Agency (EPA) seeks (hereafter called "environmental expenditures"). The ABEL model has long been available to enforcement staff to evaluate the financial health of corporations, and the more recently developed INDIPAY model evaluates individuals' finances. The Municipal Ability to Pay ("MUNIPAY") Model provides the analogous role in evaluating the financial status of municipalities.

The MUNIPAY Model evaluates the economic and financial condition of municipalities. This includes cities, towns, and villages of any size, and even independent and publicly owned utilities (e.g., regional wastewater treatment plants). Other local and regional governmental jurisdictions may also be amenable to a MUNIPAY analysis. The model provides a consistent and theoretically sound framework for evaluating municipal affordability cases. MUNIPAY performs two separate sets of analyses: a demographic comparison, and an affordability calculation.

The demographic analysis uses U.S. Census data from 1980 and 1990 to compare the municipality to state and national norms. The comparison includes indicators for both the community's population and income. The analysis also shows how the municipality's position has changed over time, both relative to itself and relative to changes in state norms. The demographic analysis does not give the user a specific conclusion on the municipality's demographics, but instead provides a better understanding of long-term changes in the community's resource base.

The affordability analysis involves calculations for the amount of currently available funds and then, if necessary, the amount of funds available through financing. The currently available funds calculation looks for any excess monies in the municipality's "General Fund" balance and, if applicable to the case, its "Enterprise Fund" working capital balance. If currently available funds are not sufficient to pay for the environmental expenditures, the affordability analysis then assesses the

municipality's current debt burden and its ability to take on additional debt to finance the environmental expenditures. Both sets of calculations have a solid grounding in the academic and professional literature of fiscal management and public finance.

Despite MUNIPAY's ability to provide a point estimate of the municipality's level of affordable expenditures, municipal affordability cases still require the user's best professional judgment. MUNIPAY does contain default values for certain parameters such as the maximum incremental tax burden from the environmental expenditures, but the user must still decide whether those default values are appropriate for the particular case. The model can help with these judgments, but final determination of the municipality's affordability ultimately is a decision only the enforcement professional can make.

Finally, although MUNIPAY is a sophisticated screening tool that can greatly assist enforcement professionals in evaluating municipal affordability claims, MUNIPAY by itself is not appropriate for use at a trial or in an administrative hearing. Rather, it is principally for use in settlement negotiations. If affordability testimony is to be presented at trial or in an administrate hearing, an expert should provide an independent financial analysis.[1]

B. HOW TO USE THE MANUAL

This *MUNIPAY User's Manual* contains all the information needed to run the model, as well as descriptions of the underlying formulae. This manual is designed to help you determine the appropriate MUNIPAY data input, enter such data correctly, and understand the results. Appendix A provides a detailed explanation of MUNIPAY's computational methods, but you do not need to be familiar with Appendix A to use MUNIPAY or this manual. The manual illustrates the model by using a hypothetical municipality as an example and shows a typical model run step-by-step.

Chapter 2 describes how to use MUNIPAY. Chapter 3 defines each input you will need to evaluate a municipality's ability to pay. Chapter 4 describes the results and output from the model. Appendix A explains the calculations in detail, Appendix B provides a glossary of terms and bibliography for additional reading, and Appendix C provides a copy of the data request form.

Most of this information (except Appendix A) is also in PROJECT's on-line help system, which is accessible through the F1 key from any screen within the model. If you need further assistance in operating the program or understanding the results, please contact the U.S. EPA enforcement economics toll-free helpline at 888-ECONSPT (326-6778) or benabel@indecon.com.

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[1] For assistance with the selection of an expert on financial economics analysis, enforcement staff should contact Jonathan Libber, the U.S. EPA BEN/ABEL coordinator, at 202-564-6102 or libber.jonathan@epamail.epa.gov.

If you need legal or policy guidance, please contact Jonathan Libber, the BEN/ABEL Coordinator at 202-564-6102, or e-mail him at libber.jonathan@epamail.epa.gov.

The Municipal Ability to Pay Model ("MUNIPAY") is an interactive computer program that runs in the Windows™ operating environment. This chapter contains five sections. Section A describes the structure of the computer program. Section B explains the procedures for installing the program on your computer. Section C provides data format requirements and additional helpful hints for entering data at your computer, as well an overview of error messages. Section D tells you how to calculate and print results. Section E explains how to exit the program and save files. For an in-depth description of each variable and recommended sources of information, see Chapter 3. For an in-depth explanation of the results, see Chapter 4.

A. STRUCTURE OF THE COMPUTER PROGRAM

MUNIPAY consists of five different screens: main screen/case creation, U.S. Census demographic input, financial data input, run input, and results/output. In general, you start with the main screen, enter data on separate screens, return to the main screen, then view (and print) your output from a final screen. MUNIPAY operates like EPA's BEN and PROJECT models and any standard Windows™ application (although it differs significantly from EPA's ability to pay models ABEL and INDIPAY). Use the mouse or the Tab and Return keys to move between cells and within a screen. Hold down the Shift key while pressing Tab to return to previous entries.

When you first open MUNIPAY a blank case screen appears. You can obtain a new screen at any time by selecting "New" from the File menu, or using the Ctrl+N shortcut. To toggle between cases, select the appropriate file name under the "Window" menu.

The first inputs on the case screen are case name, analyst name, and office/agency. These values are for reference only and do not affect the results. Next MUNIPAY asks for the municipality's type and state. Entity type will usually be "City/Town/Village." But for a Clean Water Act or Safe Water Drinking Act case, the entity type will typically be an Enterprise Fund, which accounts for municipal activities that operate more like a business (i.e., levying charges upon users in relation to services consumed).

Below these inputs on the left-hand side of the screen are buttons for entering demographic and financial data. The demographic input screen will be the same regardless of which entity type you select, although different sections of the financial data screen will be grayed-out depending on the entity type.

The right side of the case screen is for run management. Here you can create a new run, enter or edit run data, copy a run, remove a run, and calculate a run. You can create multiple runs for each case. A separate button on this side of the screen is for the demographic comparison, which requires no run creation.

The run screen is where you enter the environmental expenditures for which the municipality is liable. You must enter all the expenditure data before you can run an affordability analysis. From the run screen you can go to the options screen, which allows you to modify MUNIPAY's standard values for the run parameters. You will never need to use this screen unless you want to customize the default settings.

The output screen displays the results of MUNIPAY's calculation. Here you have three options. You can print out a summary of the calculation, view a breakdown of the calculations, print out a detailed version of all the calculations, and/or you can return to the run screen.

Once you are finished with a calculation, you can create, edit or calculate other runs. You can even create other case files, and toggle between them. Before you exit MUNIPAY you have the option of saving the current case, but you can also save your case file at anytime during your session. All runs are automatically saved with the case. The case is saved with a ".mun" extension in the folder you specify.

At any time during your use of the model you can access the help system by pressing the F1 key, just as in any Windows application.

B. PROGRAM INSTALLATION

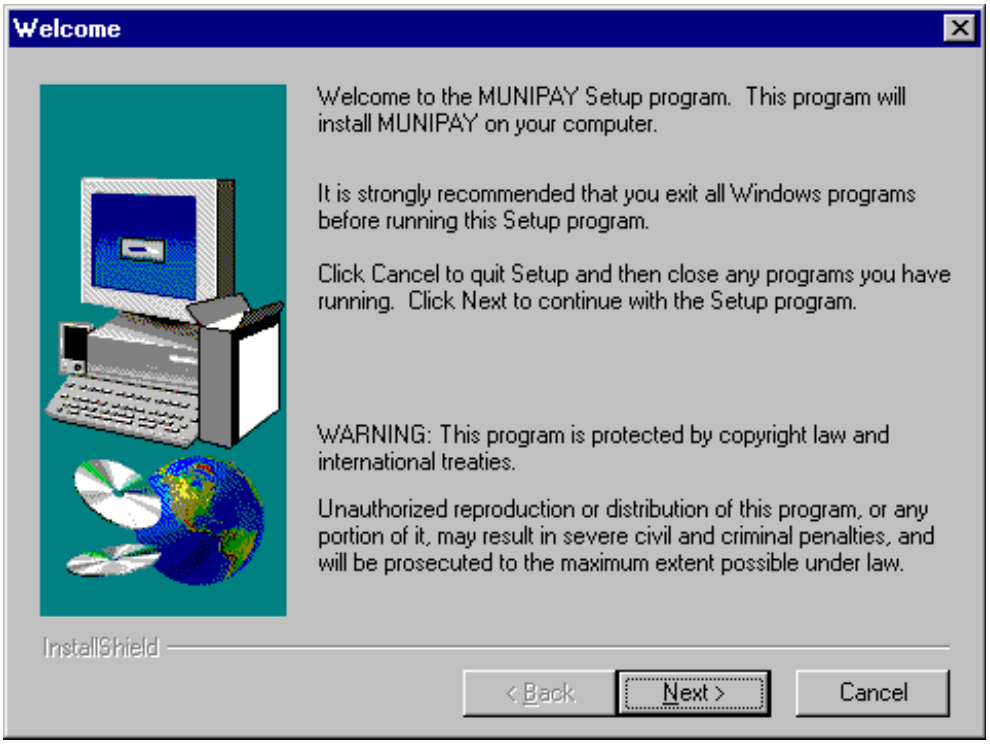
MUNIPAY requires a personal computer running the Windows operating system (Windows 95 or higher). In addition, for optimal formatting of various data entry screens, set your display in the control panel to the "small fonts" option. ("Small fonts" is the Windows default, so unless your display settings have been altered, your computer should be set appropriately.)

The remainder of this section describes how to install MUNIPAY from EPA's website or from a CD, onto a local network or stand-alone PC. If you have trouble downloading or installing the model, consult your local computer technician.

MUNIPAY is located on the EPA website at http://es.epa.gov/oeca.[2] To install MUNIPAY first download the installation file to your computer or network, then run the file and follow the steps listed below for installing it from a compact disc. The installation screens will appear as they do for installation from a CD.

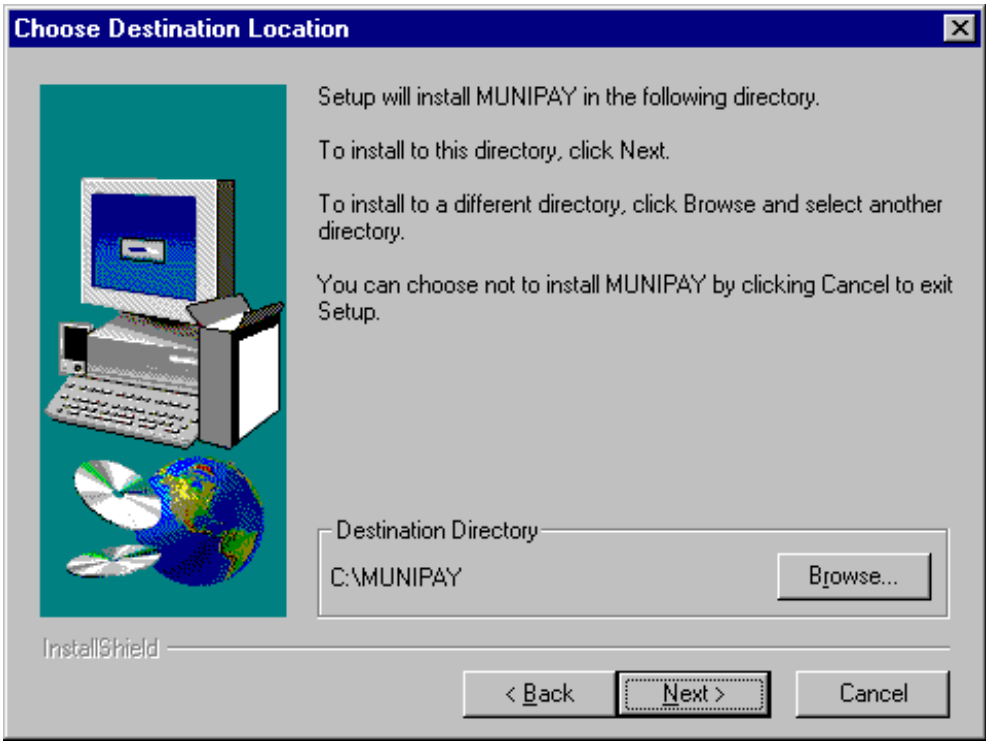
If you have access to the CD, insert it into the CD drive and run "d:\setup.exe" (or "e:\setup.exe" if the CD is in the e:\ drive). Then click **[OK].** If you receive a warning message that you cannot copy a file because it is in use, simply click **[OK]**. It is merely notifying you that the file the installation system is trying to copy already exists on your computer and is currently open.

The first MUNIPAY setup screen will appear:

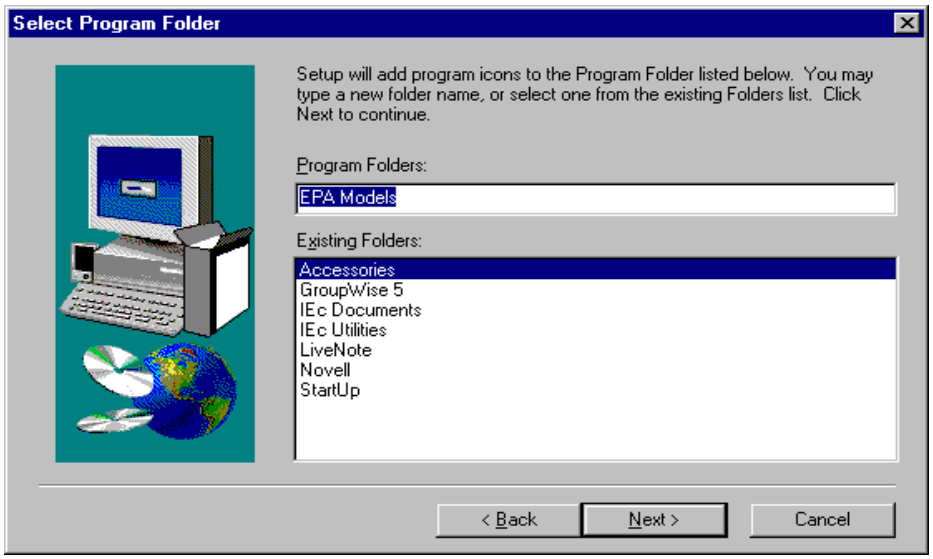


You should close all other programs before installing the model. To do so, click on **[Cancel]**, close the programs and repeat the appropriate steps above. Otherwise click **[Next]** and proceed to the second screen as shown below:

[2] This address may have changed by the time you read this manual. To obtain the current address, you can call the helpline at 888-ECON-SPT.



The second screen offers you the opportunity to designate a directory in which to store the model. The default directory is "c:\MUNIPAY" (assuming that your local hard drive is c:\). If you wish to save the model to a different directory, press **[Browse]** and choose your desired directory. To proceed with the MUNIPAY installation, press **[Next]**. The next setup screen allows you to choose a program folder name as shown below:



The default folder name is EPA Models, which you may alter. To continue installation press **[Next]**. The setup program will create an icons for MUNIPAY and finish installing it. When you have completed the installation process, you should reboot your computer prior to using the MUNIPAY model or any other software package.

Once you have loaded MUNIPAY onto your hard drive, simply double-click the model icon to start the program. If you did not change the default directory and folder, MUNIPAY will be listed on the start menu under programs in the "EPA Models" folder.

After installing the model, you may wish to create a folder for storage of all your case files. Alternatively, you may also choose to save your case files in any pre-existing directories corresponding to different cases or projects

C. DATA ENTRY

Like other Windows™-based programs MUNIPAY uses the mouse or the Enter and Tab keys to move from entry to entry or from screen to screen. Hold down the Shift key while pressing Tab to return to previous entries. Each screen has several options and spaces for input.

MUNIPAY will accept several entry formats. Numerical values can include but do not require commas. Monetary values may include decimals but will be rounded to the nearest dollar. They may be entered with or without dollar signs. Rates or percentages should be entered as a decimal number without a percent symbol (e.g., enter 0.25 to represent 25 percent). If you type 25 for a percentage rate, MUNIPAY will read it as a rate of 2500 percent.

MUNIPAY converts all dates to a "1-Jan-2000" format, but can understand almost any sensible format. If you enter an atypical date format, be sure to check that MUNIPAY has interpreted it as you intended.

Be careful to use only number keys to enter numerical values. A frequent mistake is typing the lowercase letter **L** instead of a number **1**. Another error occurs when the letter **O** is typed instead of the number **0** (zero).

MUNIPAY will tell you if the format for the entry is incorrect. If this happens correct the number and enter it again. Some inputs are limited to a range of values. If an entered value falls out of this range, MUNIPAY will display an error message with the allowable range of values. Other error messages will appear if you did not enter data in a required field.

You may enter variables on the same screen in any order. The only exception to this is that you must have entered all of the inputs for a case before you create a run. Therefore you will receive non-entry error messages only when moving from screen to screen or creating a run.

After typing your entry you might discover that you have typed an incorrect letter or number. Typing errors are easy to correct: simply return to the relevant value and type over the mistake. Like all computer programs, MUNIPAY follows the GIGO protocol: "Garbage In, Garbage Out." Verifying your data inputs is extremely important.

D. CALCULATING AND PRINTING RESULTS

To perform a demographic comparison, simply click the button for this, located on the right-hand side of the main screen.

To perform an affordability analysis, select the desired run title from the list on the main screen and press **[Calculate]**. If you have entered data for only one run, you will therefore have only one run to choose.

On the calculate screen, you can view the summary, or also choose to see the details (both for financing and for the actual calculations) on a separate screen. The **[Summary]** print button will print only the information from the first screen. The **[Detail]** option will print both screens.

For more information on interpreting results see Chapter 4, as well as the detailed calculations in Appendix A, call EPA's toll-free enforcement economics support helpline at 888-ECONSPT (326-6778).

Although printing is done from the output screen, the printer setup is controlled by the pull-down menu on the main screen. The printer setup allows you to shift between landscape and portrait printing, as well as choose more advanced options.

MUNIPAY also allows you to save the calculation summary or details by using the print-to-file option. To do so, click on the **[File]** button in the lower left hand corner before clicking the appropriate print button. MUNIPAY will ask you to choose a name and directory for the resulting output file. The data is saved in a .htm file and can be viewed using any world wide web browser (e.g. Netscape Navigator™, Microsoft Explorer™). To switch back to printer mode after printing to a file, click on the **[Printer]** button in the lower-left corner.

E. EXITING AND SAVING

You exit MUNIPAY just like any other standard Windows application. From the main screen, select Exit under the File pull-down menu at the top left corner of your screen, click on the **[x]** button at the top right corner of your screen, or double-click on the MUNIPAY icon at the top left corner of your screen. MUNIPAY will ask you if you want to save your work before you exit.

Be sure to save your case(s) before you exit. You save a case by selecting "Save" under the File menu or by using the Ctrl+S shortcut. You may also give the case a new name by selecting the "Save As…" option. MUNIPAY cases are automatically saved with the extension ".mun" and can be accessed using the "Open" command under the File menu or the Ctrl+O shortcut. You can save cases in any folder, and switch between different folders at any time. Runs are automatically saved as part of a case.

To assess a municipality's ability to afford the sought environmental expenditures, MUNIPAY requires basic case information, as well as detailed demographic and financial data, plus certain run inputs. This chapter explains the variables in the order in which you enter them in MUNIPAY. The explanations include a brief description of the criteria you should use in developing the input values, and the basis for each of the standard values.

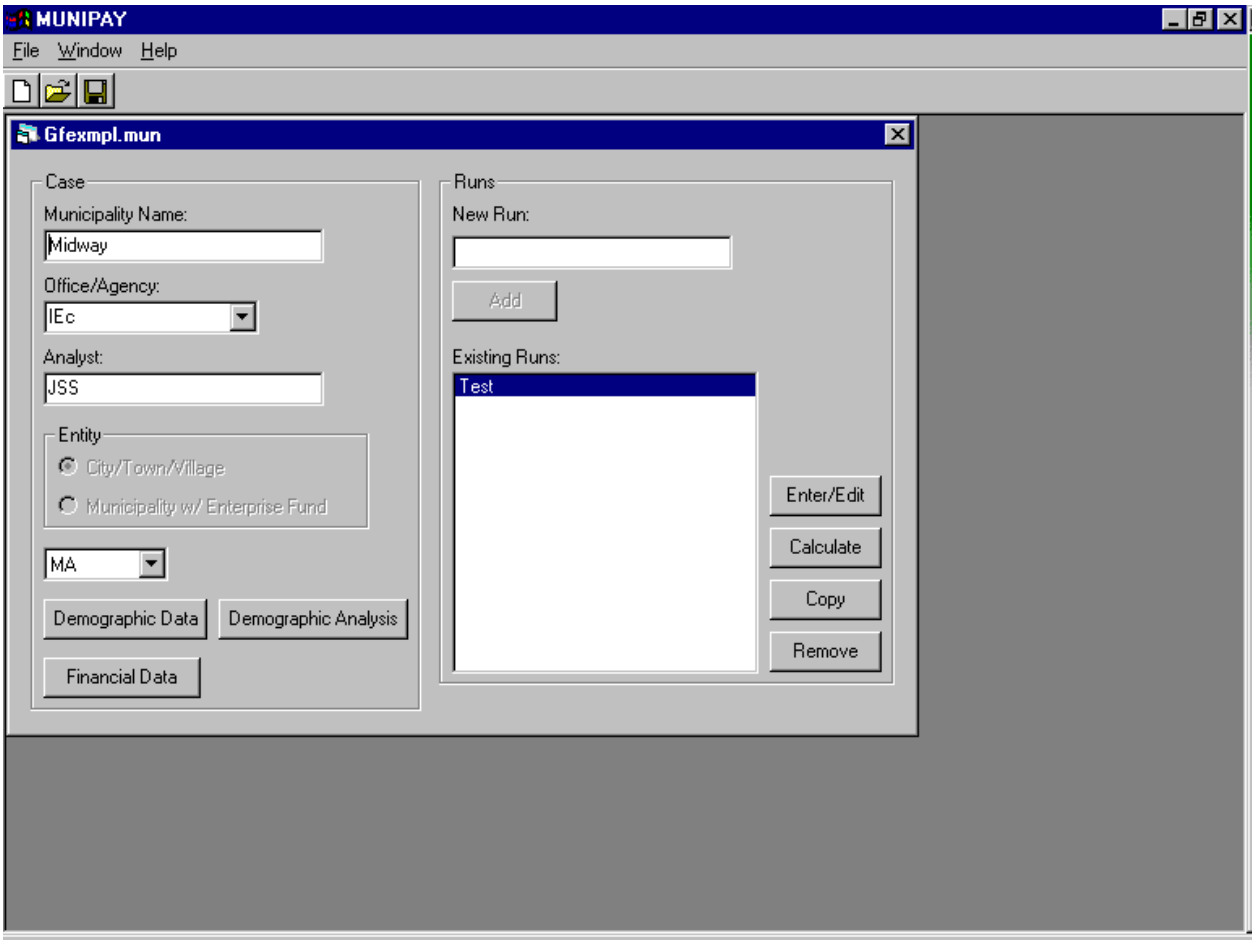
A. CASE SCREEN

The main case screen shown on the following page is what you see when you first open MUNIPAY. On the left-hand side of the screen, you enter the case name, office/agency, analyst name, entity type, and state. This section also displays the button that you click on to view the demographic and financial data entry screens. On the right-hand side of the screen, you can add, edit, calculate, and remove runs, as well as perform demographic comparisons.

1. Municipality Name, Office/Agency, Analyst Name

Case name, office/agency, and analyst name are the first three inputs in MUNIPAY. They are for reference purposes only and do not affect the calculations, but do appear along with the current date in a footer at the bottom of the printed results. These entries can be any length and can contain letters, spaces, punctuation, and numbers (although they may not be left blank).

- **Municipality Name:** the name of the municipality.
- **Office/Agency:** pull down menu to the right of the cell lists all ten EPA regions, EPA headquarters, and "other"; free-form entries also allowed.
- **Analyst Name:** typically the user's name.



2. Entity Type and State

a. Entity Type

MUNIPAY asks you to designate the entity type as either "City/Town/Village" or "Enterprise Fund." The model runs its affordability analysis using financial data, which typically concerns the Governmental Funds of a municipality. In these instances, the "City/Town/Village" selection is appropriate. But for a Clean Water Act or Safe Water Drinking Act case, the relevant data (and corresponding entity type selection) probably concerns a municipality's Enterprise Fund. This option accounts for municipal activities that operate more like a business (i.e., levying charges upon users in relation to services consumed).

If a Clean Water Act or Safe Water Drinking Act case involves a regional authority not tied to any single municipality, then select the Enterprise Fund type. Later during the financial data input stage, you will have to enter a zero for the fields related to the General Fund. (Note that such an independent and publicly owned utility is not the same as a privately owned yet publicly regulated utility, for which no screening model exists.)

For Superfund cases, a municipality will sometimes account for the operations of its municipal landfill by using an Enterprise Fund. For RCRA cases, a municipality will also sometimes use an Enterprise Fund to account for activities related to the violation. Both of these situations are fairly rare, and even if such an Enterprise Fund exists, an analysis of the municipality's Governmental Funds may be more relevant.

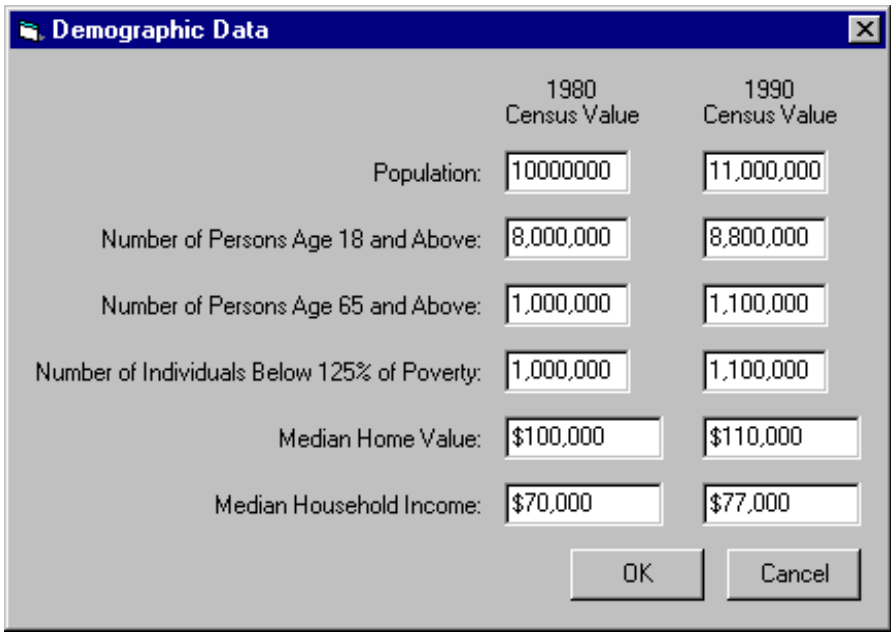
For other types of local and regional governmental jurisdictions, contact the U.S. EPA Helpline at 888-ECONSPT for guidance on MUNIPAY's applicability.

b. State

Select the municipality's state from the 50 states listed on the pull-down menu.

B. DEMOGRAPHIC DATA

Below is the screen for entering and editing U.S. Census demographic data. The municipality should already have completed the corresponding section of the data request form, which provides advice on exactly where to locate each requested item from a U.S. Census data source. (You can select "Print Data Request Form" from the "File" menu at the top of MUNIPAY's main screen to print a copy of the data request form.) If the municipality has not completed this form, you can obtain the required U.S. Census data from publicly available sources as noted in Appendix C.



C. FINANCIAL DATA

Before starting the analysis, the municipality should already have completed the corresponding section of the data request form. MUNIPAY collects different types of financial data depending on the municipality's type, so certain sections of the financial data entry screen will be grayed-out depending on which entity type you specified on the main screen. The screen for entering and editing the financial data is shown below.

In addition to the data items below, the municipality should provide its annual audited financial statements, bond prospectuses, and budgets for the last three years. Financial statements and bond prospectuses are also available for many cities from commercial providers. (One such provider is located on the internet at www.dpcdata.com.)

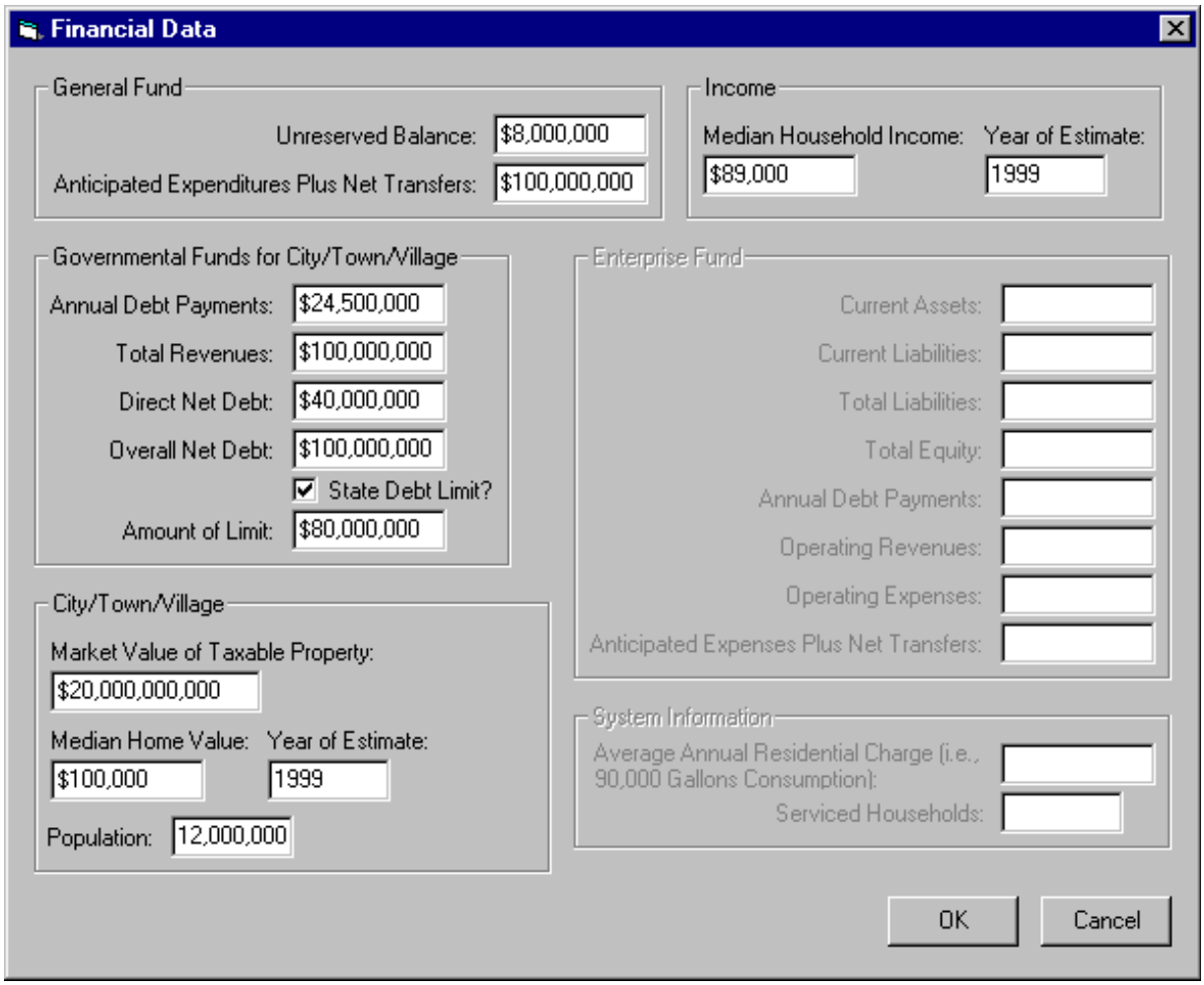
Appendix B provides a glossary of terms. You might also want to note the following tips for ensuring proper data entry.

- **!** Check that the municipality has provided the market value of taxable property, not the assessed value (which can differ significantly from the market value).

- **!** MUNIPAY will reject any figure for overall net debt that is less than direct net debt, since overall net debt includes both the municipality's direct net debt and the net debt of any underlying or overlapping jurisdictions.

- **!** Check the box to the left of state limit only if a state statute imposes a limit upon the municipality's debt level; municipalities often imposes debt and taxation limits upon themselves, but that is an issue of political willingness to pay, not financial ability to pay.

- **!** For annual residential charges, enter the user charges that a municipality would assess an average household, which is typically defined as 90,000 gallons each year. If the municipality does not meter such consumption, or if the case involves services other than water or wastewater (e.g., electricity), then enter whatever other figure constitutes the best estimate of the average annual charge. If the Enterprise Fund's operating revenues and expenses combine both water and wastewater, then enter the combined charge, but double the run parameters that relate to median household income (as described later in this chapter).

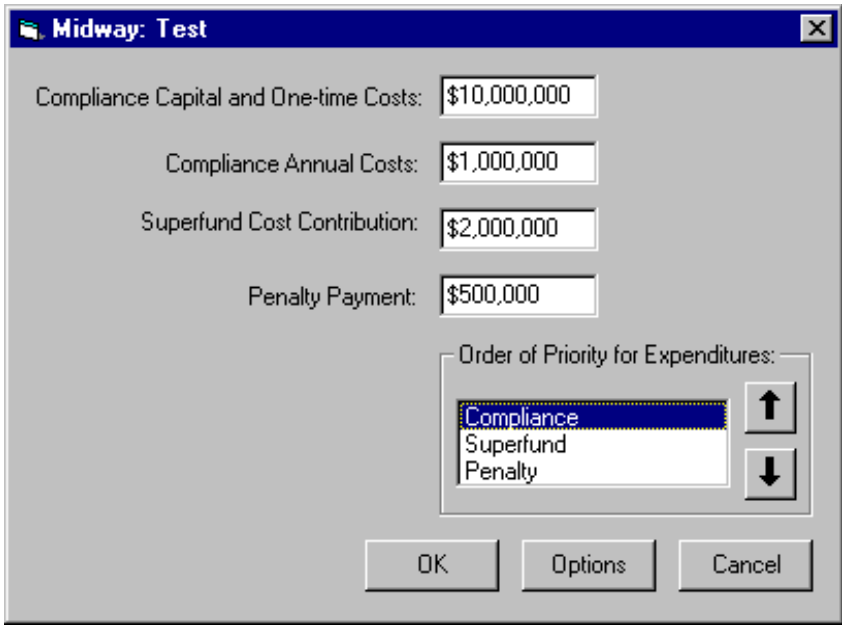


D. RUN INPUT SCREEN

You must create a run before you can enter environmental expenditure information. To add a new run, enter the run name on the right-hand side of the main screen under "New Run:" and press **[Add]**. MUNIPAY will save the new run and list it under "Existing Runs." Run names can be any length and include any letter, punctuation or number. Each case may contain multiple runs. Additional runs are useful when you want to compare the effects of changing variables.

To copy an existing run, select the run you wish to copy from the list of existing runs and press **[Copy]**. A window will appear asking you to enter a name for the new run. No two runs can have the same name. Enter the new name and press **[OK]** to save the new run or **[Cancel]** to delete it. The copy will contain all of the information from the original. Copies are particularly useful when making only minor changes in expenditure and/or parameter information from run to run, because they can be used to carry over consistent data.

To remove a run, select it from the existing run window and press **[Remove]**. A window will appear asking you if you are sure. Press **[Yes]** and the run is deleted. Remember that MUNIPAY does not have a "trash bin" to hold deleted runs, so you will have no way to retrieve a run once you have removed it.



1. Environmental Expenditures

To access the run input screen shown above, select a run and press **[Enter/Edit],** or simply double click on the run name. MUNIPAY assumes that all of the following cost inputs are in current dollars.

- **Compliance Capital and One-Time Costs:** sum of all capital investments and one-time costs necessary for compliance (e.g., design and construction costs for a wastewater treatment plant).

- **Compliance Annual Expenses:** average yearly total of all annually recurring expenses necessary for compliance (e.g., annual operation and maintenance costs for a wastewater treatment plant, excluding interest, other financing expense, or annualized capital recovery expense).

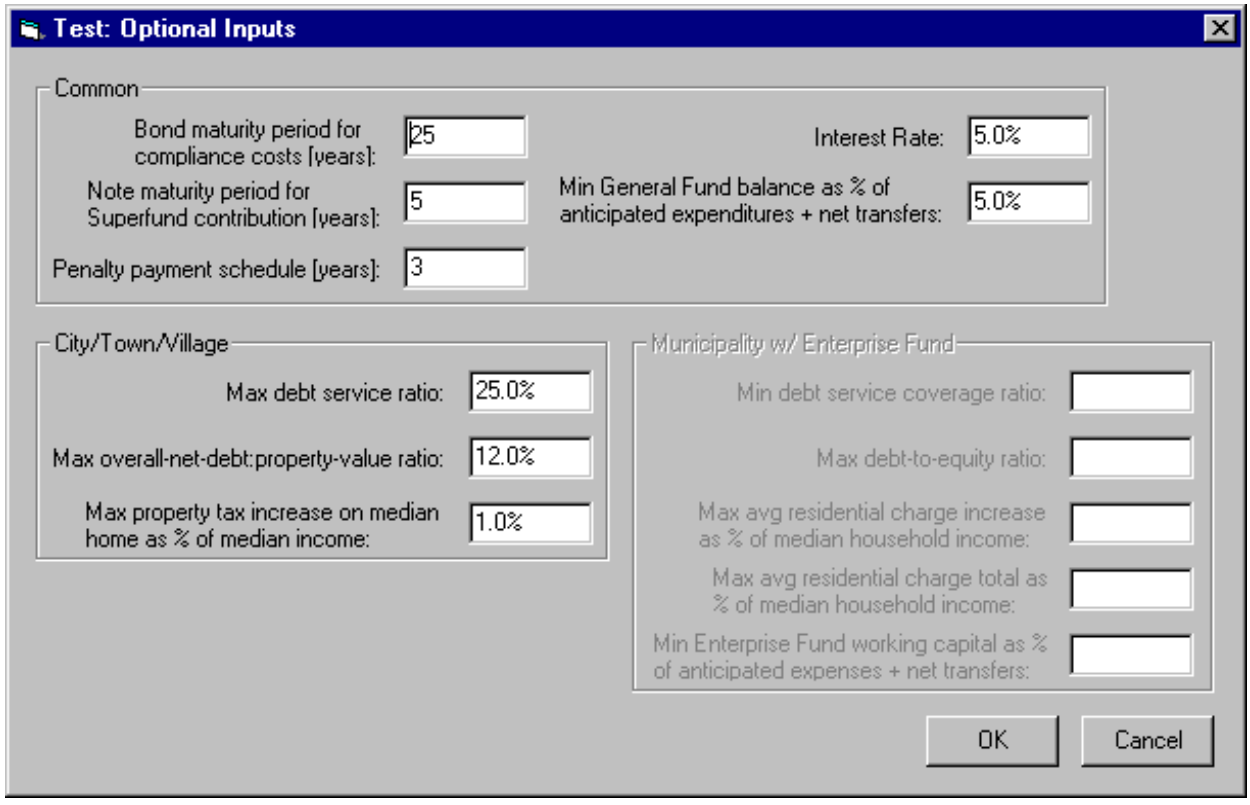
- **Superfund Cost Contribution**: remediation liability expressed as a one-time lump sum.[3]

- **Penalty Payment:** total penalty demand as a one-time payment.

If you are seeking more than one type of environmental expenditure, then you may wish to alter the order of priority for expenditures. MUNIPAY's default is to assume that compliance costs have the highest priority, followed by Superfund cost contributions, followed by any penalty payment. To alter this default hierarchy, click on each type of expenditure in turn, and then click on the up or down arrow.

2. Optional Run Parameters

From the environmental expenditures screen, click on the **[Options]** button to modify MUNIPAY's affordability run analysis parameters. As indicated in the following sections, certain parameters are grayed-out depending on which entity type you specified earlier on the main screen.



[3] Cleanup costs under other remediation statutes (e.g., Oil Pollution Act, Underground Storage Tanks, RCRA Corrective Action) should generally be entered under the Compliance Costs category. This is a somewhat moot issue though, since the user can always modify each expenditure category's priority and run parameters.

a. Common Run Parameters

The following run parameters are applicable to the analysis regardless of which entity type you specified for the case on the main screen.

Bond Maturity Period for Compliance Costs
Note Maturity Period for Superfund Contribution
Penalty Payment Schedule

These entries define the financing period for each category of environmental expenditures. Generally, the maturity period of a debt instrument should not exceed the life of the funded project. A longer period will lower the annual debt repayment burden but also increase the total interest payments, with the net effect possibly increasing the affordability.[4] A longer period will also extend the annual repayment burden (even though it is lower) over a longer period of time, an important economic burden that is not a direct factor in the affordability calculations.[5]

The compliance 25-year default value reflects the upper end of the useful life of a typical pollution control investment. The Superfund five-year default value, however, limits the annual debt repayment burden to a fairly short period of time, much shorter than the life of the typical remediation project. This is a policy decision to create a less burdensome standard for Superfund affordability relative to compliance cost affordability. The three-year penalty payment schedule reflects the maximum length that U.S. EPA is typically willing to accept.

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[4] The net effect of changes in this and other parameters only "possibly" increases the affordability because this particular threshold criteria may not be a binding constraint upon the municipality's ability to issue additional debt. Most MUNIPAY run parameters function independently of each other, and the constraint that is binding will depend on the particular financial inputs. For example, a 25-year maturity period may allow a $1 million bond, whereas a 30-year maturity period may allow a $1.1 million bond. But if another run parameter limits the bond to only $900,000, such a scenario's maturity period would have no affordability impact.

[5] This is a burden because it extends the period over which the municipality is able to assume less debt for other expenditures. For example, a 25-year maturity period means that the municipality will use a portion of its taxing and debt repayment capacity for the environmental expenditures at issue, making that portion unavailable for other purposes over a period of 25 years. A 30-year maturity period would further decrease the availability of taxing and debt repayment capacity by an additional five years.

Interest Rate

This entry determines the annual debt service for financing a given amount over a given maturity period. A lower interest rate may possibly increase the firm's ability to pay.

The default is based upon a composite of municipal issues, using the most recent data at the time of the annual model update. If you have specific information about the municipality's interest rates for recent debt issues, you can enter a custom value. Alternatively, you may wish to obtain a more recent average value from the Federal Reserve web site at www.bog.frb.fed.us/releases/H15/. Also, a newspaper's business section provides a composite interest rate for municipal bonds, representing an average of various maturity periods and ratings.

Minimum General Fund Balance as a % of Anticipated Expenditures and Net Transfers

The default value for the minimum General Fund unreserved balance as a percentage of budgeted/anticipated expenditures and net transfers out is five percent. Any portion of the unreserved fund balance above this amount is considered currently available for environmental expenditures. The default value is based upon recommendations from the public finance and management literature.[6] A higher value may possibly decrease the municipality's ability to pay.

b. City/Town/Village

The following run parameters are specific to the City/Town/Village entity type, and therefore will be grayed-out if you specified Enterprise Fund on the main screen.

Maximum Debt Service Ratio

The default value for the debt service ratio (i.e., total debt service payments (principal and interest) of all governmental funds divided by their total revenues) is 25 percent. The calculations for future financing of environmental expenditures limit additional debt issuance such that its

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[6] Moody's Investors Services, *Moody's on Municipals: An Introduction to Issuing Debt* (1991), p. 27; Freda S. Johnson, "Credit Fundamentals — The Rating Agency Perspective," *The Handbook of Municipal Bonds and Public Finance*, eds. Robert Lamb, James Leigland, and Stephen Rappaport (1993), p. 124; Claire Gorham Cohen, "Analyzing Government Credit," *The Handbook of Municipal Bonds and Public Finance*, eds. Robert Lamb, James Leigland, and Stephen Rappaport (1993), p. 134; Lon Sprecher, "Operating Budgets," *Local Government Finance: Concepts and Practices*, eds. John E. Petersen and Dennis R. Strachota (1991), p. 62; Robert N. Anthony and David W. Young, *Management Control in Nonprofit Organizations* (1988), p. 540.

repayment would not result in a higher than specified debt service ratio. The higher the value, the higher the ability to pay might be.

The default value slightly exceeds the "warning marks" found in the public finance and management literature.[7] A municipality can maintain a higher level of debt service, but a higher level may reduce the confidence of creditors that the municipality can repay its debt on time. This reduction in confidence could make it more difficult for the municipality to borrow funds in the future.

Maximum Overall-Net-Debt : Property-Value Ratio

This ratio is an indicator of the relative level of the municipality's current debt burden. The calculations for future financing of environmental expenditures limit additional debt issuance such that it does not result in a ratios higher than the specified value. The higher the value, the higher the ability to pay might be. The public finance and management literature generally recommends that the ratio for overall net debt as a percentage of market value for taxable property not exceed 12 percent, which is therefore the default value.[8]

Maximum Property Tax Increase as a % of Median Household Income

The default value for the maximum value of a property tax increase on the median home value as a percentage of median household income is 1.0 percent. MUNIPAY calculates the additional annual user property taxes that the median homeowner will need to pay for the municipality to finance the environmental expenditures, and checks that these annual property taxes do not exceed the specified percentage of median household income. The higher the threshold value, the higher the ability to pay might be. The intent of the default value is to correspond very roughly

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[7] George G. Kaufmann and Philip J. Fischer, "Debt Management," in *Management Policies in Local Government Finance*, eds. J. Richard Aronson and Eli Schwartz, p. 300; Sanford M. Groves and Maureen Godsey Valente, *Evaluating Financial Condition: A Handbook for Local Government*, p. 88; Standard and Poor's Corporation, *S&P's Municipal Finance Criteria* (2000), p. 25.

[8] George G. Kaufmann and Philip J. Fischer, "Debt Management," in *Management Policies in Local Government Finance*, eds. J. Richard Aronson and Eli Schwartz, p. 300; Sanford M. Groves and Maureen Godsey Valente, *Evaluating Financial Condition: A Handbook for Local Government*, p. 85; Robert Berne and Richard Schramm, *The Financial Analysis of Government*, p. 260; Moody's Investor Services, *Pitfalls in Issuing Municipal Securities*, p. 19.

with the recommended maximum user fee burdens for households under various EPA policy guidelines.[9]

c. Enterprise Fund

The following run parameters are specific to the Enterprise Fund entity type, and therefore will be grayed-out if you specified City/Town/Village on the main screen.

Minimum Debt Service Coverage Ratio

The minimum value for the debt service coverage ratio is 110 percent. This ratio is equal to net operating revenue (total operating expenses minus revenue) divided by annual principal and interest payments. It determines affordability in conjunction with the user charge burden ratios. MUNIPAY calculates the user charge increase that is necessary to cover the debt service for the environmental expenditures at the level this value specifies, and then checks if this user charge increase falls within the values the user charge burden ratios specify. The default value represents an adequate yet not excessive coverage of debt service requirements.[10]

Maximum Debt-to-Equity Ratio

The maximum value of the debt-to-equity ratio is 200 percent. The debt-to-equity ratio is equal to total debt divided by total equity (i.e., assets minus debt). The calculations for future financing of environmental expenditures limit additional debt issuance such that it will not cause the debt-to-equity ratio to exceed the specified value.

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[9] For a summary of these, see *Evaluating Municipal Environmental Burdens*, prepared for the U.S. EPA Office of Policy, Planning, and Evaluation, by The Cadmus Group, Inc., September 30, 1994. See also U.S. EPA Office of Water, *Combined Sewer Overflows — Guidance for Financial Capability Assessment and Schedule Development*, March 1997; and U.S. EPA Region V Water Division, *Interim Procedures for Conducting Municipal Financial Capability Analysis in Support of Water Enforcement Actions*, June 1997.

[10] Moody's Investors Services, *Moody's on Municipals: An Introduction to Issuing Debt* (1991), p. 26; David Ambler, James Burr, Katherine McManus, Howard Mischel, and Diana Roswick, "Revenue Bond Credit Analysis," *The Handbook of Municipal Bonds and Public Finance*, eds. Robert Lamb, James Leigland, and Stephen Rappaport (1993), p. 154; John E. Petersen and Thomas McLoughlin, "Debt Policies and Procedures," *Local Government Finance: Concepts and Practices*, eds. John E. Petersen and Dennis R. Strachota (1991), p. 278; Standard and Poor's Corporation, *S&P's Municipal Finance Criteria* (200), p. 111.

The default value represents a debt-to-equity ratio that would be quite high for a for-profit company and at the high end of actual municipal enterprise funds.[11] Even higher values, however, are feasible without necessarily leading to severe fiscal problems, although an enterprise fund's credit rating could suffer from an exceedingly high debt-to-equity ratio.

Maximum Average User Charge Increase as a % of Median Household Income
Maximum Average User Charge Total as a % of Median Household Income

The default values for the maximum value of the average user charge increase as a percentage of median household income and the maximum value of the average user charge total are 1.0 percent and 2.0 percent respectively. (The 90,000 gallon level is a standard approximation of typical household water or wastewater use. If the enterprise fund is not a water or wastewater fund, then the user charges represent the municipality's estimate of a typical household bill.)

MUNIPAY calculates the additional annual user charges that the average household will need to pay for the municipality to finance the environmental expenditures, and checks that these annual user charges do not cause the above thresholds. Higher threshold values may result in improved ability to pay. The intent of the default values is to correspond very roughly with the recommended maximum burdens for households under various EPA policy guidelines.[12] If the user charge represents a combined bill for both water and wastewater (because the Enterprise Fund's operating revenues and expenses represent both water and wastewater), then you should double these run parameters.

Minimum Working Capital as a % of Anticipated Expenses and Net Transfers

The default value of the minimum Enterprise Fund working capital balance as a percentage of budgeted/anticipated expenditures and net transfers out is five percent. MUNIPAY consider any portion of the working capital balance above this amount to be currently available for environmental expenditures. The default value is based upon recommendations from the public finance and management literature. Higher values may decrease the ability to pay.

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[11] Clyde P. Stickney, *Financial Statement Analysis: A Strategic Perspective*, p. 240.

[12] For a summary of these, see *Evaluating Municipal Environmental Burdens*, prepared for the U.S. EPA Office of Policy, Planning, and Evaluation, by The Cadmus Group, Inc., September 30, 1994. See also U.S. EPA Office of Water, *Combined Sewer Overflows — Guidance for Financial Capability Assessment and Schedule Development*, March 1997; and U.S. EPA Region V Water Division, *Interim Procedures for Conducting Municipal Financial Capability Analysis in Support of Water Enforcement Actions*, June 1997.

You should increase this value only if you believe the enterprise fund's revenues and/or expenditures are subject to significantly higher than average variability (e.g., a significant portion of revenues from user fees from an unstable source, frequent weather emergencies that lead to unexpected expenditures, etc.). Such variability could justify the maintenance of a working capital balance exceeding five percent to cover revenue shortfalls or emergency expenditures. You would therefore enter a value above five percent to reflect the municipality's particular situation.

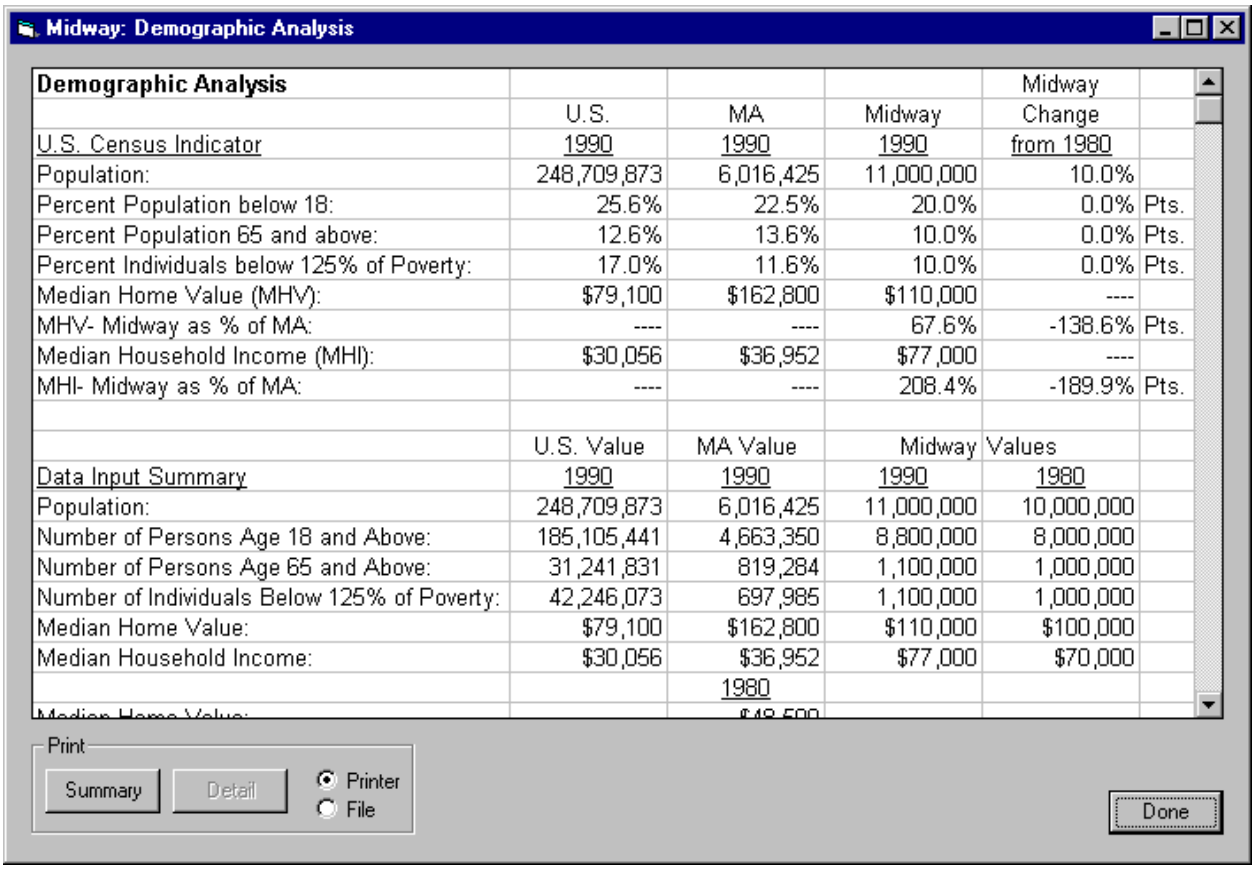
This chapter explains how to interpret the results from MUNIPAY's demographic and affordability runs. (Chapter 2 explains the mechanics of how to perform a run, and Chapter 3 explains the data necessary for a run.) Various buttons for conducting demographic and affordability analyses are found on the right-hand side of MUNIPAY's main screen. These calculations operate completely independently of each other. The following sections describe how to interpret each analysis.

A. DEMOGRAPHIC ANALYSIS

To perform a demographic analysis, click on the **[Run]** button at the bottom of the main screen, in the box titled "Demographic Analysis." MUNIPAY displays a table for the results, as shown on the following page.[13] To print your results (either to a printer or a file) click on the **[Print]** button. The following sections explain the significance of each result.

Unlike the Affordability Analysis, the Demographic Analysis does not produce a single point estimate or assessment for the community's economic health. Instead, it generates comparisons with state and national norms for selected U.S. Census indicators. The Demographic Analysis thus provides more general, background information on the community than the Affordability Analysis's point estimate. The Demographic Analysis can also aid the advanced user (i.e., an analyst familiar with financial economics, especially pertaining to municipalities) in modifying the default parameters for the Affordability Analysis. For example, a 25-percent debt service ratio might be sustainable for a community with a solid resource base, but overly burdensome for a community whose economic health appears to be deteriorating sharply. The required inputs to the Affordability Analysis do

[13] The final column displaying the municipality's change from 1980 generally expresses the results in terms of percentage points ("% Pts."). Therefore, a change in a value from 10 percent in 1980 to 12 percent in 1990 is a change of two percentage points ("2.0% Pts."), rather than 20 percent (i.e., (12/10 - 1) * 100).



include demographic data (e.g., income, population, home value), so the affordability results will always reflect certain aspects of the municipality's demographics.

1. Population

All else being equal, the higher the population, the higher the ability to afford a certain level of environmental expenditures. A positive percentage change in population since 1980 is a sign of a growing and probably vibrant community. A negative change is a possible sign of a community in decline, often with accompanying symptoms of economic distress.

2. Population Below 18

A high percentage of the population below 18 years old relative to national and state averages indicates a greater financial burden to households from non-wage earning dependents, and a greater financial burden to municipalities and school districts from provision of services. It can also indicate a younger and therefore growing community. A positive change in this percentage since 1980 is a possible sign of an influx of young families, probably indicating a growing community.

3. Population 65 and Above

A high percentage of the population 65 and above relative to national and state averages possibly indicates a constrained resource base, with many residents on a fixed income. On the other hand, according to some measures, the elderly now constitute society's most economically well-off group. Therefore, depending on the interpretation and the larger context, a growing percentage of the elderly population could indicate either an outflux of younger members from a declining community, or wealthy retirees moving to a desirable community.

4. Percent of Individuals Below 125% of Poverty

A high percentage of individuals below 125% of the poverty level relative to national and state averages indicates a constrained resource base and a greater burden upon municipal services.[14] A percentage of impoverished individuals that has increased significantly between 1980 and 1990 is a strong indication of economic distress.

5. Median Home Value

A high median home value relative to national and state averages can indicate a relatively prosperous community with a strong property tax base. A community could nevertheless be relatively prosperous and have a low median home value, simply because a more rural landscape keeps land prices low. Thus, you may want to compare home values for the municipality with those in adjacent communities to gain a better understanding of your results.[15] A median home value that has increased significantly between 1980 and 1990 relative to the state average is a strong indication of a growing community.

6. Median Household Income

A high median household income relative to national and state averages is an indication of a relatively prosperous community. A community could nevertheless be relatively prosperous despite low income measures if its cost of living is correspondingly low. Thus, you may want to compare income measures for the municipality with those in adjacent communities to gain a better

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[14] MUNIPAY uses individuals below 125% of the poverty level, instead of simply individuals below poverty (i.e., below 100% of the poverty level), to provide a broader measure of the population living in poor economic circumstances.

[15] You can look up U.S. Census data for neighboring communities. States agencies may have more recent data, although availability varies widely by state.

understanding of your results.[16] Income measures that have increased significantly between 1980 and 1990 relative to the state average are a strong indication of an improving local economy.

B. AFFORDABILITY ANALYSIS

The affordability analysis is more complex than the demographic analysis, and therefore requires more input from the user. Chapter 2 explains the mechanics of how to perform a run, and Chapter 3 explains the data necessary for a run. The following sections explain how to interpret the affordability analysis summary, the currently available funds calculations, and the funds available through future financing. (Appendix A explains the underlying calculations.)

1. Affordability Analysis Summary

The following page provides an example of the affordability analysis summary. The three rows in the table at the top of the screen correspond to the three types of environmental expenditures, in order of their priority. The first column displays the amount sought for each type of expenditure. The next two columns display the funds that are currently available to pay for the expenditures. (If the analysis is for a City/Town/Village with no relevant Enterprise Fund, then the first of these two columns will always display a zero.) The following column displays the funds that are available through financing. The final column displays the total available, which simply adds together the second through fourth columns.

If the amount in the final column is equal to the sought amount in the first column, then the sought amount is affordable within the specified run parameters. If the amount in the final column is less than the sought amount, then the sought amount is not affordable within the specified run parameters, and the amount in the final column is instead the maximum affordable amount.

The same screen provides a breakdown for the currently available funds calculation. The two columns correspond to the Enterprise Fund and the General Fund. The first row displays the most recent balance (i.e., the user's entry for the General Fund, and — if applicable — the Enterprise Fund's excess of current assets over current liabilities). The recommended balance in the second row is equal to five percent (or some other value, if the default value is modified) of anticipated expenses/expenditures for the fund (as entered by the user). The available amount in the third row is simply equal to the excess (if any) of the first row over the second. This amount is then distributed among the sought expenditures in order of their priority (with the default order being compliance, Superfund, then penalty).

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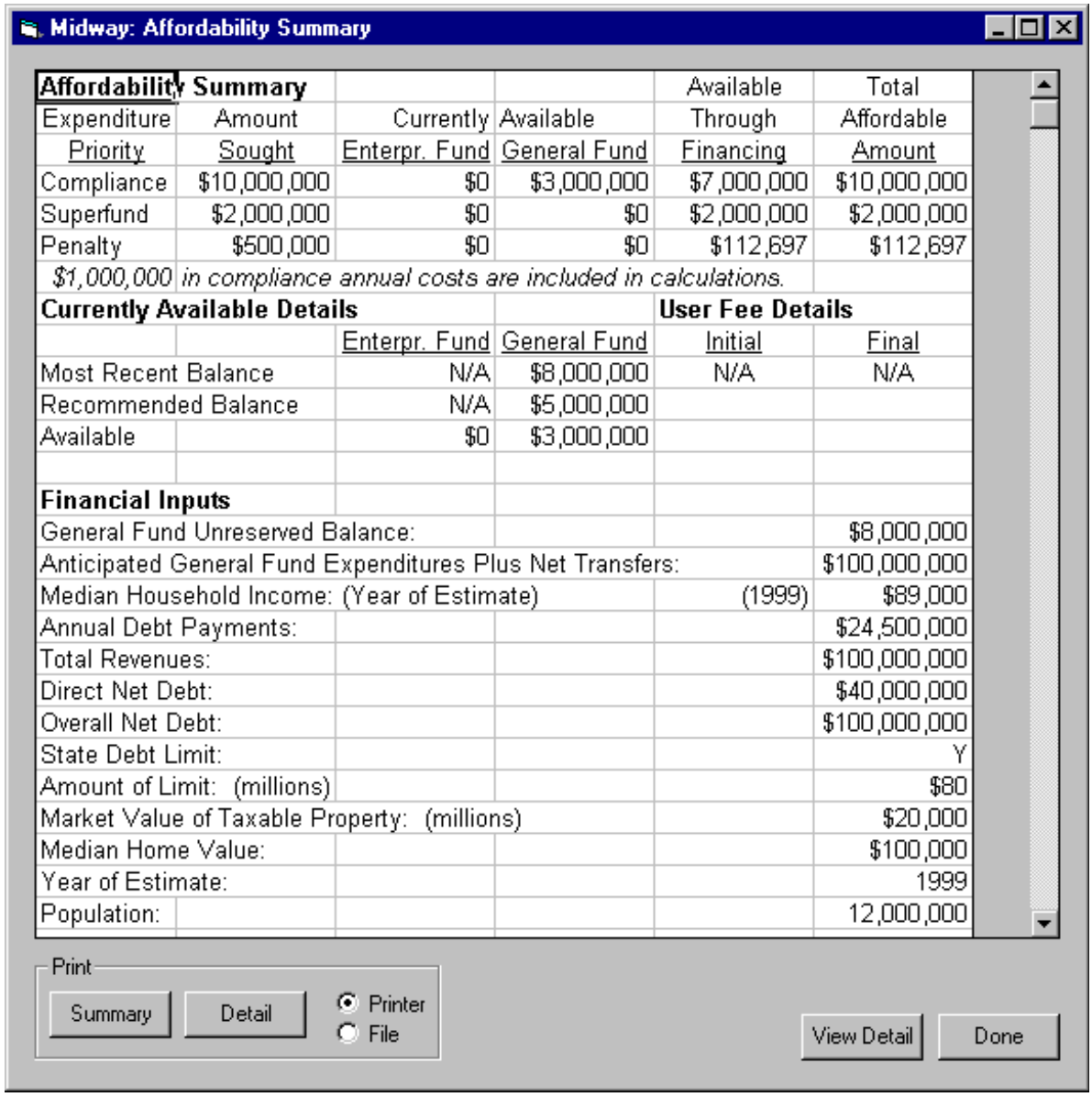
[16] As with home value data, you can look up U.S. Census data for neighboring communities. States agencies may have more recent data, although availability varies widely by state.

In the same section of this screen, MUNIPAY also displays for an Enterprise Fund the initial average user fees and the final fees once the affordable expenditures are incurred by the municipality. Although the affordability analysis does not use these figures (instead focusing on user fees as a percentage of household income), they are displayed here as potentially useful background information.

The final section of this screen provides a list of the financial inputs and run parameters that MUNIPAY used for the analysis.



2. Affordability Analysis Details

The following two pages provide the affordability analysis detail screens for both City/Town/Village and Enterprise Fund cases. The rows of the main table correspond to the different financial criteria, which differ depending on whether the entity type is City/Town/Village or Enterprise Fund. (Otherwise, the main tables are identical) The first column displays the existing values for the criteria. These values allow you to examine the current financial condition of the municipality before it must pay for the environmental expenditures. The second column displays the threshold values for the criteria. The threshold values are either the default values or the custom values that the user specified in the optional run parameters screen. (The threshold value for the direct debt level is equal to the state limit, which the municipality supplies on its data request form

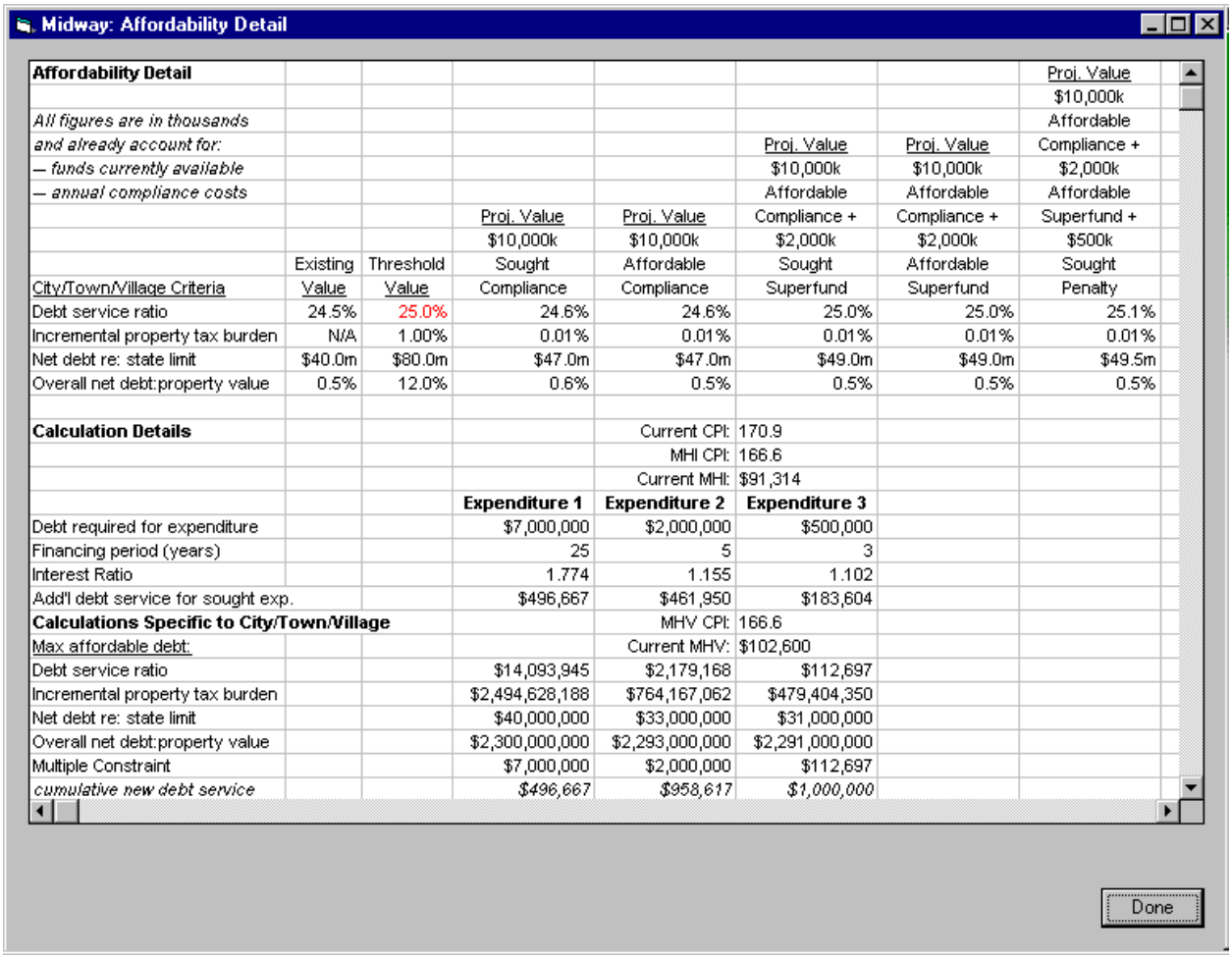
and the user then enters in the financial data screen, not the run parameters screen.) The third column displays the projected values for the criteria were the municipality to pay for the full amount of the sought compliance costs, as displayed in thousands of dollars. (Some of the payment for the sought compliance costs could include the previously calculated currently available funds.)

If the projected values from the sought compliance amount all fall within the threshold values, then the sought amount is affordable within the specified run parameters. Therefore the fourth column for the maximum compliance amount essentially repeats the third column. If the projected values exceed any of the threshold values, then the sought amount is not affordable within the specified run parameters. Therefore the fourth column displays the values for a maximum compliance amount that is less than the sought amount. If the affordable amount is less than the sought amount, then MUNIPAY will display any exceeded threshold value in red.[17]

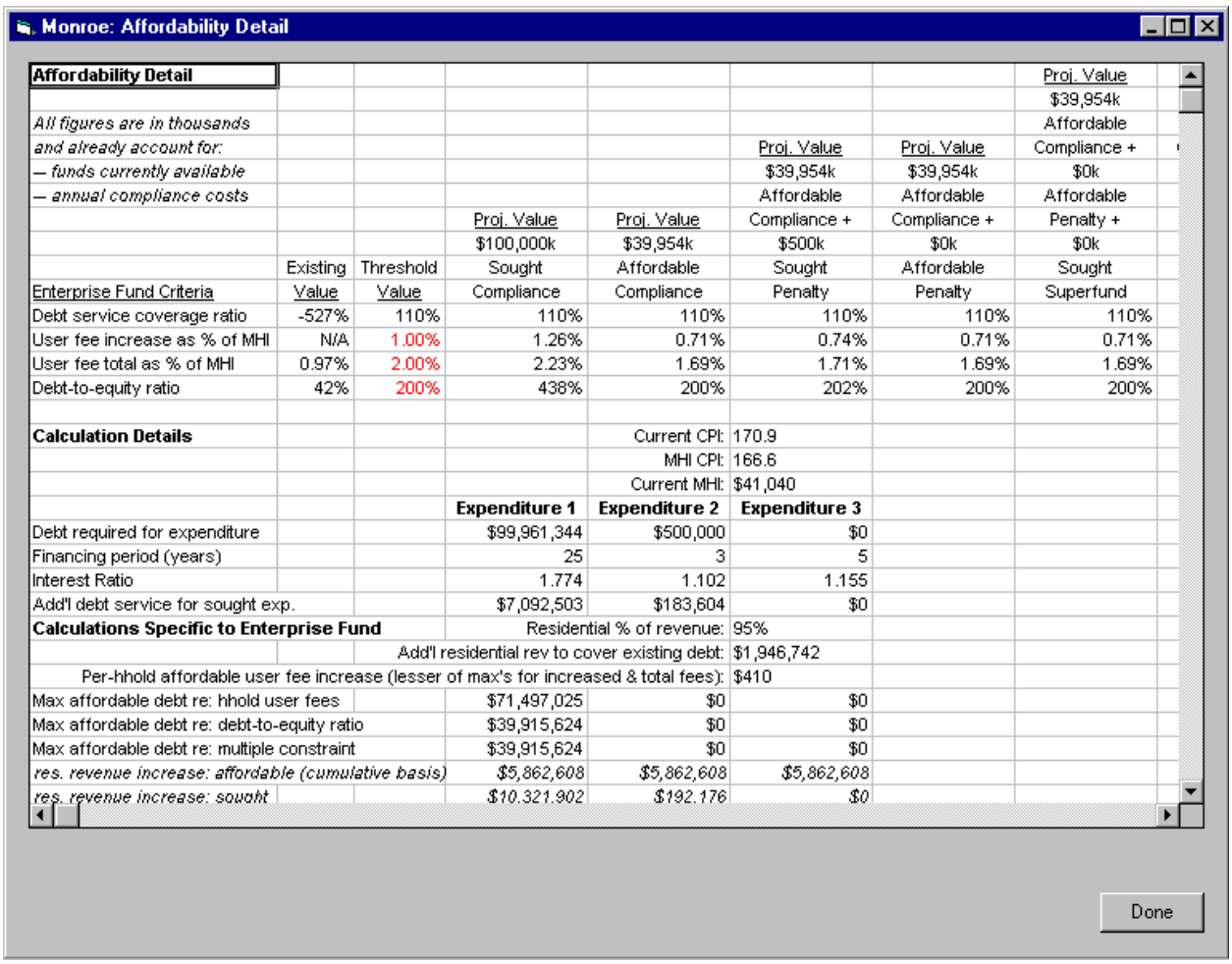
If more than one category of environmental expenditure is sought, then the relevant results will appear in additional columns. Each additional category will have two additional columns, with these fifth and six (and then seventh and eighth) columns similar to the third and fourth columns. The difference is that the additional categories must already take account of the financial burden imposed by the expenditure(s) with higher priority. This is because MUNIPAY exhausts the municipality's financial capability on each sought expenditure before moving to the expenditure with lesser priority. Therefore, if the full amount of the first expenditure is not fully affordable, then no amount of the following expenditures will be affordable.

For further information on the threshold values, see Chapter 3. For further information on the affordability calculations displayed at the bottom of the screen, see Appendix A.

[17] The projected values for the Enterprise Fund debt service coverage ratio are always equal to the threshold value, regardless of the existing value or level of environmental expenditures. MUNIPAY always raises (or lowers) user charges so that the debt service coverage ratio reaches its threshold value, and then determines whether the user charges fall within the values for relative household burdens.



Affordability Detail							Proj. Value
							$10,000k
All figures are in thousands							Affordable
and already account for:					Proj. Value	Proj. Value	Compliance +
— funds currently available					$10,000k	$10,000k	$2,000k
— annual compliance costs					Affordable	Affordable	Affordable
			Proj. Value	Proj. Value	Compliance +	Compliance +	Superfund +
			$10,000k	$10,000k	$2,000k	$2,000k	$500k
	Existing	Threshold	Sought	Affordable	Sought	Affordable	Sought
City/Town/Village Criteria	Value	Value	Compliance	Compliance	Superfund	Superfund	Penalty
Debt service ratio	24.5%	25.0%	24.6%	24.6%	25.0%	25.0%	25.1%
Incremental property tax burden	N/A	1.00%	0.01%	0.01%	0.01%	0.01%	0.01%
Net debt re: state limit	$40.0m	$80.0m	$47.0m	$47.0m	$49.0m	$49.0m	$49.5m
Overall net debt:property value	0.5%	12.0%	0.6%	0.5%	0.5%	0.5%	0.5%
Calculation Details				Current CPI:	170.9		
				MHI CPI:	166.6		
				Current MHI:	$91,314		
			Expenditure 1	**Expenditure 2**	**Expenditure 3**		
Debt required for expenditure			$7,000,000	$2,000,000	$500,000		
Financing period (years)			25	5	3		
Interest Ratio			1.774	1.155	1.102		
Add'l debt service for sought exp.			$496,667	$461,950	$183,604		
Calculations Specific to City/Town/Village				MHV CPI:	166.6		
Max affordable debt:				Current MHV:	$102,600		
Debt service ratio			$14,093,945	$2,179,168	$112,697		
Incremental property tax burden			$2,494,628,188	$764,167,062	$479,404,350		
Net debt re: state limit			$40,000,000	$33,000,000	$31,000,000		
Overall net debt:property value			$2,300,000,000	$2,293,000,000	$2,291,000,000		
Multiple Constraint			$7,000,000	$2,000,000	$112,697		
cumulative new debt service			*$496,667*	*$958,617*	*$1,000,000*		



Affordability Detail							Proj. Value
							$39,954k
All figures are in thousands							Affordable
and already account for:					Proj. Value	Proj. Value	Compliance +
— funds currently available					$39,954k	$39,954k	$0k
— annual compliance costs					Affordable	Affordable	Affordable
			Proj. Value	Proj. Value	Compliance +	Compliance +	Penalty +
			$100,000k	$39,954k	$500k	$0k	$0k
	Existing	Threshold	Sought	Affordable	Sought	Affordable	Sought
Enterprise Fund Criteria	Value	Value	Compliance	Compliance	Penalty	Penalty	Superfund
Debt service coverage ratio	-527%	110%	110%	110%	110%	110%	110%
User fee increase as % of MHI	N/A	1.00%	1.26%	0.71%	0.74%	0.71%	0.71%
User fee total as % of MHI	0.97%	2.00%	2.23%	1.69%	1.71%	1.69%	1.69%
Debt-to-equity ratio	42%	200%	438%	200%	202%	200%	200%
Calculation Details				Current CPI:	170.9		
				MHI CPI:	166.6		
				Current MHI:	$41,040		
			Expenditure 1	**Expenditure 2**	**Expenditure 3**		
Debt required for expenditure			$99,961,344	$500,000	$0		
Financing period (years)			25	3	5		
Interest Ratio			1.774	1.102	1.155		
Add'l debt service for sought exp.			$7,092,503	$183,604	$0		
Calculations Specific to Enterprise Fund				Residential % of revenue:	95%		
				Add'l residential rev to cover existing debt:	$1,946,742		
Per-hhold affordable user fee increase (lesser of max's for increased & total fees):					$410		
Max affordable debt re: hhold user fees			$71,497,025	$0	$0		
Max affordable debt re: debt-to-equity ratio			$39,915,624	$0	$0		
Max affordable debt re: multiple constraint			$39,915,624	$0	$0		
res. revenue increase: affordable (cumulative basis)			*$5,862,608*	*$5,862,608*	*$5,862,608*		
res. revenue increase: sought			*$10,321,902*	*$192,176*	*$0*		

This technical appendix provides the methodology and detailed calculations that MUNIPAY uses to determine a municipality's ability to afford environmental expenditures. MUNIPAY performs two separate analyses: a demographic comparison, and an affordability calculation. Separate sections below explain the underlying basis for each analysis.

MUNIPAY references a Microsoft Excel™ spreadsheet to perform all of its present value calculations, although you do not need Excel to run MUNIPAY. The data you enter into the program is automatically transferred to the spreadsheet. The spreadsheet calculates the demographic and affordability analyses and returns the results to the program for output.

The spreadsheet is in your MUNIPAY folder (on your C drive or wherever else you installed MUNIPAY), filename "mun****.xls". The asterisks represent the most recent year for which EPA has performed updates for the spreadsheet. You may open the file, although you should do so as read-only to protect the integrity of the calculations. This spreadsheet contains necessary formulas and background information (e.g., U.S. Census data for all states). The background information is updated once a year, but the calculations remain the same.

A. DEMOGRAPHIC ANALYSIS

The demographic analysis uses U.S. Census data to compare the municipality to state and national norms. The comparison includes indicators for both the community's population and income. The analysis also shows how the municipality's position has changed from 1980 to 1990, both relative to itself and relative to changes in the state norms. The user must enter the data for the municipality; MUNIPAY already contains databases for national norms and all 50 states. Unlike the affordability analysis, the demographic comparison requires no run parameters, and displays its results in a single table. Also in contrast to the affordability analysis, the demographic analysis does not give the user a specific conclusion on the municipality's demographics, but instead provides a better understanding of long-term changes in the community's resource base.

As might be expected, the demographic comparison calculations are relatively simple as compared to those of the affordability analysis. The formulas consist entirely of subtraction and division, and their derivation should be intuitively obvious given the description of the comparisons in Chapter 3. If you want to confirm your understanding of the calculations, open the spreadsheet ("mun****.xls") to the "print" worksheet. Cell range A1:F11 corresponds to the demographic comparison. Most formulas reference cells named for the inputs from the demographic data entry screen.

B. AFFORDABILITY ANALYSIS

The affordability analysis includes calculations for the amount of currently available funds and then — if necessary — the amount of funds available through financing. The user can accept MUNIPAY's default values for the run parameters, or instead customize them. The currently available funds calculation looks for any excess monies in the municipality's Enterprise Fund working capital balance (if applicable to the case) and the General Fund balance. If currently available funds are insufficient to afford the environmental expenditures, the affordability analysis then assesses the municipality's current debt burden and its ability to take on additional debt to finance the environmental expenditures. MUNIPAY displays a summary table for the affordable level of environmental expenditures (including details for the currently available funds calculation), plus an exhibit for funds available through future financing (which details the municipality's current condition and its projected condition from the sought and affordable level of expenditures).

MUNIPAY evaluates a municipality's ability to afford three distinct types of environmental expenditures: compliance costs, Superfund cleanup contributions, and penalty payments. In cases that involve more than one type of expenditure, the user can select the priority for the different types of expenditures. MUNIPAY's default setting is for compliance costs to receive the highest priority, then a Superfund cleanup contribution, and finally a penalty payment. MUNIPAY will therefore — if necessary — apply all of the municipality's funding capability toward a higher-priority environmental expenditure leaving no funds available for lower-priority expenditures.

1. Currently Available Funds

The currently available funds calculations is the least complex aspect of the affordability analysis, involving only multiplication and subtraction. The analysis starts with the most recent Fund balance (i.e., the Enterprise Fund's — if applicable — excess of current assets over current liabilities, and the user's entry for the General Fund). Then MUNIPAY calculates the recommended balance as equal to five percent (or some other value, if the default value is modified) of anticipated expenses/expenditures for the Fund (as entered by the user). The currently available amount is then simply the excess (if any) of the Fund balance over the recommended balance. This amount is then distributed among the sought expenditures in order of their priority (with the default order being compliance, Superfund, then penalty).

If you want to confirm your understanding of the calculations, open the spreadsheet ("mun****.xls") to the "print" worksheet. Cell range H8:K12 corresponds to the currently available funds calculation. The formulas generally reference cells named for the inputs from the financial data entry screen.

2. Future Financing

If currently available funds from the Enterprise Fund working capital balance and/or General Fund unreserved fund balance are insufficient to cover the full amount of the sought environmental expenditures, MUNIPAY examines the funds available through future financing. This can take the form of a bond issue for compliance costs, a note for a Superfund cleanup contribution, or a payment schedule for a penalty. The amount of sought future financing is equal to the total sought amount minus currently available funds.

For a City/Town/Village without an enterprise fund relevant to the environmental expenditures, MUNIPAY examines the capacity for general obligation debt.[18] If the municipality instead has a relevant Enterprise Fund, MUNIPAY examines the capacity for revenue debt.[19] In either case, MUNIPAY first computes various ratios that indicate the municipality's current debt burden. After this computation it determines if the highest-priority category of the sought environmental expenditures is affordable and, if not, what the maximum affordable amount is. Keeping with the hierarchy of the three types of environmental expenditures, MUNIPAY then examines the debt capacity remaining for the next-highest priority of environmental expenditures, and then the final category. If necessary, MUNIPAY will exhaust all of the municipality's debt capacity on higher-priority environmental expenditures, leaving no financing available for lower-priority expenditures.

The calculations for funds available through future financing are considerably more complicated than those for currently available funds. In broad terms, MUNIPAY analyzes the municipality's current and projected obligations from the perspective of three criteria: total debt stock (i.e., total amount of debt relative to various measures), annual debt flow (i.e., debt service or payments), and incremental household burden (i.e., taxes or user charges for the typical household).

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[18] General obligation debt, often called full faith and credit debt, derives its repayment security from the full taxing and revenue-generating capacity of a municipality. Debt service payments for these types of bonds come from local taxes, usually the local property tax. If levied taxes are insufficient to meet payments, the local authority is legally required to raise the tax rate or broaden the tax base to generate sufficient funds.

[19] Revenue debt derives its repayment security from the revenues that the debt-funded project generates. For example, wastewater disposal charges cover service on debt issued to build a new wastewater treatment plant. Hence, the cost of this debt is borne by those paying for the services that the funded project provides.

Specifically, MUNIPAY evaluate these criteria using four tests, which differ depending on which entity type the user initially specified.

For each test (usually expressed as a ratio), MUNIPAY's future financing screen displays the existing value, then analyzes the impact on the test of the proposed new financing burden — beginning with the highest-priority sought expenditures — and compares the projection with the threshold value. If any projection exceeds the threshold value (as displayed in red on screen), the total proposed financing is not affordable, and the model displays the test results for the maximum amount of new financing that is affordable. If the amount sought is affordable, the model then performs the same analysis for the next-highest priority expenditures. The spreadsheet printouts on the following page are from the MUNIPAY "mun****.xls" spreadsheet: cell range O1:X14 corresponds to the projections for General Obligation debt, and cell range Z1:AI14 for Revenue debt. (MUNIPAY includes this worksheet in its printed results when you select the "details" options.)

MUNIPAY's actual affordability calculations, however, differ somewhat from the section that displays the projections. At the bottom of the details screen, A16:X31 provides the calculations for General Obligation debt, and Z16:AI31 for Revenue debt.

Certain rows are specific to the entity type (as explained below in separate sections), but the first several rows perform calculations that are common to both entity types. First, the user's entry for median household income is translated in current dollars, using an index for Consumer Price Index values. Then, for each expenditure, MUNIPAY determines how much debt financing is necessary, which reflects how much of the expenditure is affordable out of currently available funds. Finally, based on the interest rate and the financing period, MUNIPAY calculates the annual debt service that will be necessary to finance the expenditure.

a. General Obligation Debt

For the City/Town/Village entity type, as displayed on the following page, MUNIPAY uses the following tests to determine the affordability of additional General Obligation debt:

- Debt service ratio (i.e., annual debt payments divided by total revenues);
- Property tax incremental burden (i.e., new debt service divided by property tax base, multiplied by median home value, divided by median household income);
- State-government-imposed limit on direct net debt (i.e., the user's entry, unless no state limit exists); and,

- Ratio of overall net debt to property value (i.e., overall net debt divided by property tax base).

For the highest-priority expenditure (the column labeled "Expenditure 1" in the spreadsheet), MUNIPAY uses each test in isolation to "back-calculate" the maximum affordable debt; each test corresponds to one row. If the affordable debt is in excess of the required financing for the sought expenditure, then MUNIPAY allocates that excess to the expenditure with the next-highest priority ("Expenditure 2"), and next to the lowest-priority expenditure. Finally, for each expenditure, MUNIPAY evaluates the multiple constraints across the four different tests to determine the maximum affordable debt (now capped at the sought amount). Displayed in italics in the following row is the additional debt service for the affordable amount (cumulative across the three expenditure categories), which MUNIPAY uses merely for its ratio calculations in the financing screen.

b. Revenue Debt

For the Enterprise Fund type, as displayed on the following page, MUNIPAY uses the following tests to determine the affordability of additional revenue debt:

- Debt service coverage ratio (i.e., operating revenue minus expenses, divided by debt service);
- User fee increase (i.e., the residential portion of the system-wide revenue increase divided by the number of households, divided by median income);
- User fee total (i.e., the residential portion of the system-wide revenue increase plus the existing user fees, divided by the number of households, divided by median household income); and,
- Debt-to-equity ratio (i.e., total liabilities divided by total equity).

In comparison with the City/Town/Village calculations for General Obligation debt, MUNIPAY calculations for Revenue Debt are somewhat more complex. MUNIPAY must first perform several initial calculations:

- Residential portion of system revenue (i.e., average user charge multiplied by the number of households, divided by operating revenues);
- Additional residential revenue required for adequate coverage of existing debt service (i.e., the residential portion of the difference between existing revenues and the revenues that would be sufficient to achieve the threshold value for the debt service coverage ratio); and,
- Per-household affordable user fee increase (i.e., the maximum amount by which the average per-household user fee can be raised, as constrained by

both the tests for the user fee increase and the user fee total as a percentage of median household income).

For the highest-priority expenditure (the column labeled "Expenditure 1" in the spreadsheet), MUNIPAY uses two tests in isolation (corresponding to two separate rows) to "back-calculate" the maximum affordable debt:

- Household user fees (i.e., incorporating the residential portion of system revenue, and the maximum per-household user fee increase, as calculated above); and,

- Debt-to-equity ratio.[20]

If the affordable debt is in excess of the required financing for the sought expenditure, then MUNIPAY allocates that excess to the expenditure with the next-highest priority ("Expenditure 2"), and next to the lowest-priority expenditure. Finally, for each expenditure, MUNIPAY evaluates the multiple constraints across the two different tests to determine the maximum affordable debt (now capped at the sought amount). Displayed in italics in the following two rows are the additional residential revenues for the sought amount and for the affordable amount (the latter being cumulative across the three expenditure categories), which MUNIPAY uses merely for its ratio calculations in the financing screen.

[20] The debt coverage ratio does not appear here, since unlike the other tests for both General Obligation Debt and Revenue Debt, this ratio determines the increased user fee level that is necessary both to cover existing debt adequately and to cover any projected debt. Thus, the debt service coverage ratio is not a limit in itself, but instead works in conjunction with the user fee burden criteria to become a limiting factor.

Demographic Analysis

U.S. Census Indicator	U.S. 1990	MA 1990	Localsville 1990	Localsville Change from 1980
Population:	248,709,873	6,016,425	120,000	20.0%
Percent Population below 18:	25.6%	22.5%	8.3%	-1.7% Pts.
Percent Population 65 and above:	12.6%	13.6%	9.2%	0.2% Pts.
Percent Individuals below 125% of Poverty:	17.0%	11.6%	7.5%	-0.5% Pts.
Median Home Value (MHV):	$79,100	$162,800	$44,000	----
MHV- Localsville as % of MA:	----	----	27.0%	-55.4% Pts.
Median Household Income (MHI):	$30,056	$36,952	$33,000	----
MHI- Localsville as % of MA:	----	----	89.3%	-81.4% Pts.

Data Input Summary	U.S. Value 1990	MA Value 1990	Localsville Values 1990	1980
Population:	248,709,873	6,016,425	120,000	100,000
Number of Persons Age 18 and Above:	185,105,441	4,663,350	110,000	90,000
Number of Persons Age 65 and Above:	31,241,831	819,284	11,000	9,000
Number of Individuals Below 125% of Poverty:	42,246,073	697,985	9,000	8,000
Median Home Value:	$79,100	$162,800	$44,000	$40,000
Median Household Income:	$30,056	$36,952	$33,000	$30,000

	1980
Median Home Value:	$48,500
Median Household Income:	$17,575

Affordability Summary

Expenditure Priority	Amount Sought	Currently Available		Available Through Financing	Total Affordable Amount
		Enterpr. Fund	General Fund		
Compliance	$10,000,000	$0	$3,000,000	$0	$3,000,000
Superfund	$1,000,000	$0	$0	$0	$0
Penalty	$100,000	$0	$0	$0	$0

$1,000,000 in compliance annual costs are included in calculations.

Currently Available Details

	Enterpr. Fund	General Fund	User Fee Details Initial	Final
Most Recent Balance	N/A	$8,000,000	N/A	N/A
Recommended Balance	N/A	$5,000,000		
Available	$0	$3,000,000		

Financial Inputs

General Fund Unreserved Balance:		$8,000,000
Anticipated General Fund Expenditures Plus Net Transfers:		$100,000,000
Median Household Income: (Year of Estimate)	(1999)	$35,000
Annual Debt Payments:		$2,450,000
Total Revenues:		$100,000,000
Direct Net Debt:		$4,000,000
Overall Net Debt:		$10,000,000
State Debt Limit:		Y
Amount of Limit: (millions)		$80
Market Value of Taxable Property: (millions)		$200
Median Home Value:		$100,000
Year of Estimate:		1999
Population:		12,000,000

Run Parameters

Maturity periods/schedule for Compliance, Superfund, Penalty	25, 5, 3
Interest Rate:	5%
Min General Fund balance as % of anticipated expenditures + transfers:	5%
Max debt service ratio:	25%
Max overall-net-debt:property-value ratio:	12%
Max property tax increase on median home as % of median income:	1.00%

City/Town/Village
Affordability Detail

All figures are in thousands
and already account for:
-- funds currently available
-- annual Compliance costs

City/Town/Village Criteria	Existing Value	Threshold Value	Proj. Value $10,000k Sought Compliance	Proj. Value $3,000k Affordable Compliance	Proj. Value $3,000k Affordable Compliance + $1,000k Sought Superfund	Proj. Value $3,000k Affordable Compliance + $0k Affordable Superfund	Proj. Value $3,000k Affordable Compliance + $0k Affordable Superfund + $100k Sought Penalty	Proj. Value $3,000k Affordable Compliance + $0k Affordable Superfund + $0k Affordable Penalty
Debt service ratio	2.50%	25.00%	2.90%	2.40%	2.60%	2.40%	2.50%	2.40%
Incremental property tax burden	N/A	1.00%	2.14%	1.43%	1.76%	1.43%	1.48%	1.43%
Net debt re: state limit	$4.0m	$80.0m	$11.0m	$4.0m	$5.0m	$4.0m	$4.1m	$4.0m
Overall net debt:property value	5.00%	12.00%	10.00%	5.00%	5.50%	5.00%	5.10%	5.00%

Calculation Details

Current CPI: 170.9
MHI CPI: 166.6
Current MHI: $35,910

	Expenditure 1	**Expenditure 2**	**Expenditure 3**
Debt required for expenditure	$7,000,000	$1,000,000	$100,000
Financing period (years)	25	5	3
Interest Ratio	1.774	1.155	1.102
Add'l debt service for sought exp.	$496,667	$230,975	$36,721
Calculations Specific to City/Town/Village		MHV CPI: 166.6	
Max affordable debt:		Current MHV: $102,600	
Debt service ratio	$428,455,915	$131,616,091	$82,786,740
Incremental property tax burden	$0	$0	$0
Net debt re: state limit	$76,000,000	$69,000,000	$68,000,000
Overall net debt:property value	$14,000,000	$7,000,000	$6,000,000
Multiple Constraint	$0	$0	$0
cumulative new debt service	*$0*	*$0*	*$0*

Enterprise Fund
Affordability Detail

All figures are in thousands
and already account for:
-- funds currently available
-- annual compliance costs

Enterprise Fund Criteria	Existing Value	Threshold Value	Proj. Value $10,000k Sought Compliance	Proj. Value $3,000k Affordable Compliance	Proj. Value $3,000k Affordable Compliance + $1,000k Sought Superfund	Proj. Value $3,000k Affordable Compliance + $0k Affordable Superfund	Proj. Value $3,000k Affordable Compliance + $0k Affordable Superfund + $100k Sought Penalty	Proj. Value $3,000k Affordable Compliance + $0k Affordable Superfund + $0k Affordable Penalty
Debt service coverage ratio	9%	110%	110%	110%	110%	110%	110%	110%
User fee increase as % of MHI	N/A	1.00%	0.14%	0.14%	0.15%	0.15%	0.15%	0.15%
User fee total as % of MHI	0.28%	2.00%	0.42%	0.42%	0.43%	0.43%	0.43%	0.43%
Debt-to-equity ratio	70%	200%	82%	70%	72%	70%	70%	70%

Calculation Details

Current CPI: 170.9
MHI CPI: 166.6
Current MHI: $35,910

	Expenditure 1	**Expenditure 2**	**Expenditure 3**
Debt required for expenditure	$7,000,000	$1,000,000	$100,000
Financing period (years)	25	5	3
Interest Ratio	1.774	1.155	1.102
Add'l debt service for sought exp.	$496,667	$230,975	$36,721
Calculations Specific to Enterprise Fund			
	Residential % of revenue:	13%	
	Add'l res. rev to cover existing debt:	$244,428	
	Per hhold afford. user fee increase:	$359	
Max affordable debt re: hhold user fees	$284,901,325	$73,949,249	$45,885,199
Max affordable debt re: debt-to-equity ratio	$74,579,914	$67,579,914	$66,579,914
Max affordable debt re: multiple constraint	$7,000,000	$1,000,000	$100,000
res. revenue increase: affordable (cumulative basis)	*$443,242*	*$475,909*	*$481,102*
res. revenue increase: sought	*$443,242*	*$32,666*	*$5,193*

Phrases with underlining cross-reference other entries in the glossary. A bibliography for further reading follows on the final page.

Assets

Financial representation of economic resources owned by an organization or individual.

Balance

A fund's excess of assets over liabilities. Portions of the fund balance may be restricted, reserved, or designated.

Bond

A written promise of the issuer to pay a specified sum of money, called the face value or principal amount, at a specified date or dates in the future, called the maturity date, together with periodic interest at a specified rate.

Capital Projects Fund

A fund created for all resources used for the construction or acquisition of designated fixed assets by a governmental unit except those financed by special assessment, proprietary, or fiduciary funds.

Debt

An obligation resulting from the borrowing of money or from the purchase of goods and services. Debts of governmental units include bonds, time warrants, notes, and floating debt.

Debt Service Fund

A fund established to account for the accumulation of resources for, and the payment of, general obligation long-term debt principal and interest.

Designated Balance

The portion of a fund balance that is tentatively set aside for use in the future.

Direct Net Debt

Gross debt incurred directly in the name of the specific governmental unit, less debt fully supported from enterprise fund revenues (revenue debt), and short-term debt.

Enterprise Fund

A fund established to finance and account for the acquisition, operation, and maintenance of governmental facilities and services that are entirely or predominantly self-supported by user charges; or where the governing body of the governmental unit has decided that periodic determination of revenues earned, expenses incurred, and/or net income is appropriate. Government-owned utilities (e.g., water, sewer, electricity) and hospitals are ordinarily accounted for by enterprise funds.

Fiduciary Fund

Any fund held by a governmental unit in a fiduciary capacity, ordinarily as agent or trustee.

Flows

Processes occurring continuously through time, measured in units per time period. (Contrast with stocks.)

Fund

A fiscal and accounting entity with a self-balancing set of accounts recording cash and other financial resources, together with all related liabilities, and residual equities or balances, and charges therein, which are segregated for the purpose of carrying on specific activities or attaining certain objectives in accordance with special regulations, restrictions, or limitations.

Fund Balance

The excess of a fund's assets over its liabilities.

General Fund

A fund used to account for all transactions of a governmental unit that are not accounted for in another fund. The General Fund is used to account for the ordinary operations of a governmental unit that are financed from taxes and other general revenues.

General Obligation Bond

Bonds for whose payment the full faith and credit of the issuing body are pledged. More commonly, but not necessarily, general obligation bonds are considered to be those payable from taxes and other general revenues. In some states these bonds are called Tax Supported Bonds.

Governmental Fund

A generic classification that refers to all funds other than proprietary and fiduciary funds. Governmental fund-types includes the General Fund, special revenue funds, capital projects funds, debt service funds, and special assessment funds.

Internal Service Fund

A fund established to finance and account for services and commodities furnished by a designated department or agency to other department and agencies within a single governmental unit, or to other governmental units.

Liabilities

Debt or other legal obligations arising out of transactions in the past that must be liquidated, renewed, or refunded at some future date.

Long-Term Debt

Debt with a maturity of more than one year after the date of issuance.

Note

A written, relatively short-term promise to repay a specified principal amount of money at a specified date in the future, together with interest at a specified rate. Municipal notes usually mature in less than five years.

Overall Net Debt

Direct net debt of the specific governmental unit plus the net debt of overlapping and underlying units of government apportioned in accordance with property valuation. Although overlapping and underlying debt is not a liability of the specific governmental unit, it is supported by the same property tax base as the debt of the specific governmental unit, and therefore is an important factor in the ability of that unit to issue additional debt.

Proprietary Fund

A fund established to account for self-sustaining or profit-oriented activities. Includes enterprise funds and internal service funds.

Reserved Balance

The portion of a fund balance that is reserved either for inventories (representing non-liquid resources) or for encumbrances, which are monies that have been appropriated for a purchase but not yet expended.

Restricted Balance

The portion of a fund balance that is legally restricted to specified uses.

Revenue Debt

Debt whose principal and interest are payable exclusively from the earnings of an enterprise fund.

Short-Term Debt

Debt with a maturity of one year or less after the date of issuance. Short-term debt typically takes the form of a note.

Special Assessment Fund

A fund established to account for the construction of improvements or provision of services that are to be paid for, wholly or in part, from special assessments levied against benefitted property.

Special Revenue Fund

A fund established to account for revenues from specific taxes or other earmarked revenue sources that by law are restricted to the financing of particular functions or activities of government.

Stocks

Accumulated quantities existing at a particular time, measured in terms of units with no time dimension. (Contrast with flows. Also note that this meaning of the term "stocks" is not to be confused with its meaning as a synonym for a company's equity shares.)

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The following sections provide a copy of the MUNIPAY data request forms, as well as explanations of the required data entries. Section A provides a copy of the request form for U.S. Census data, which MUNIPAY uses for its demographic analysis. Sections B provides a copy of the financial data request form. You can also print these forms from within the model.

A. U.S. CENSUS DATA

Municipality & State: _____ ____	**1980 Census Value**	**1990 Census Value**
Population		
Number of Persons above age 17		
Number of Persons above age 64		
Number of Individuals Below 125% of Poverty		
Median Home Value		
Median Household Income		

U.S. Census data for 1980 is available at State Data Centers. A list of centers is available from the U.S. Bureau of the Census at 301-457-4100.

U.S. Census data for 1990 is available at **www.census.gov**: click on the large "Search" button, then click on "Place Search". The following screen will give you the opportunity to type in the municipality's name. Select the correct municipality from the displayed list, and click on its "STF3A" table button. Select the relevant census tables by checking the boxes on the left side of the screen for each of the census titles for which you would like information; the table below indicates

which titles you will need. After you have checked all of the necessary boxes, scroll to the top of the page and click "Submit". Finally, select a format to view the data (HTML format, Tab-delimited format, or CODATA format) and press "Submit". You should now have the 1990 U.S. Census data for the municipality.

Census Designation	Census Descriptor	MUNIPAY Input Used For
P1	Persons	Population
P13	Age	Number of Persons above age 17
P13	Age	Number of Persons above age 64
P121	Ratio of Income to Poverty Level	Number of Individuals Below 125% of Poverty
H61A	Median Value	Median Home Value
P80A	Median Household Income	Median Household Income

B. FINANCIAL DATA

MUNIPAY runs its affordability analysis on financial data, which typically concerns the Governmental Funds of a municipality. This corresponds to the "City/Town/Village" selection under the "entity type" entry. But for a Clean Water Act or Safe Water Drinking Act case, the relevant data (and corresponding entity type selection) probably concerns a municipality's Enterprise Fund, which accounts for municipal activities that operate more like a business (i.e., levying charges upon users in relation to services consumed).

If a Clean Water Act or Safe Water Drinking Act case involves a regional authority not tied to any single municipality, then select the Enterprise Fund type, but enter a zero for all the fields related to the General Fund. (Note that such an independent and publicly owned utility is not the same as a privately owned yet publicly regulated utility, for which no screening model exists.)

For Superfund cases, a municipality will sometimes have an Enterprise Fund that accounts for the operations of its municipal landfill. For RCRA cases, a municipality will sometimes have an Enterprise Fund that accounts for activities related to the violation. Both of these situations are fairly rare, and even if such an Enterprise Fund exists, an analysis of the municipality's Governmental Funds may be more relevant.

For other types of local and regional governmental jurisdictions, contact the U.S. EPA Helpline at 888-ECONSPT for guidance on MUNIPAY's applicability.

In addition to the data items below, the municipality should provide for the last three years its annual audited financial statements, bond prospectuses, and budgets. Financial statements and bond prospectuses are also available for many cities from commercial providers. (One such provider is located on the internet at www.dpcdata.com.)

Common Financial Data	
General Fund Unreserved Balance: (for most recent fiscal year; omit if independent utility)	
Anticipated General Fund Expenditures Plus Net Transfers: (budgeted or projected)	
Median Household Income: (either U.S. Census, or more recent estimate)	
Year of Estimate: (if U.S. Census, year should be 1989)	
City/Town Village Financial Data (i.e., Governmental Funds)	
Annual Debt Payments: (sum of principal and interest payments for all Governmental Funds)	
Total Revenues: (for all Governmental Funds, but exclude transfers between funds)	
Direct Net Debt: (gross debt incurred in municipality's name, less short-term and revenue debt)	
Overall Net Debt: (above + overlapping/underlying gov't units' debt apportioned by property value)	
State Debt Limit: (attach calculations, or note if state imposes no such limit)	
Market Value of Taxable Property: (attach calculations if converted from assessed)	
Median Home Value: (either U.S. Census, or more recent estimate)	
Year of Estimate: (if U.S. Census, year should be 1990)	
Population: (either U.S. Census, or more recent estimate)	
Enterprise Fund Financial Data	
Current Assets: (exclude any restricted assets)	
Current Liabilities: (exclude liabilities payable from restricted assets)	
Total Liabilities:	
Total Equity:	
Annual Debt Payments: (sum of principal and interest payments from Statement of Cash Flows)	
Operating Revenues:	
Operating Expenses:	
Anticipated Expenses Plus Net Transfers: (budgeted or projected)	
Average Annual Residential Charge: (typically based on 90,000 gallons for water/sewer; if operating revenues & expenses represent combined water & sewer, then enter combined charge)	
Serviced Households: (if unknown, use number of households from U.S. Census)	